

104
LAW ENFORCEMENT TECHNOLOGY

Y 4. J 89/1:104/20

Law Enforcement Technology, Serial...

HEARING
BEFORE THE
SUBCOMMITTEE ON CRIME
OF THE
COMMITTEE ON THE JUDICIARY
HOUSE OF REPRESENTATIVES
ONE HUNDRED FOURTH CONGRESS

FIRST SESSION

MAY 17, 1995

Serial No. 20



FEB 11 1996

Printed for the use of the Committee on the Judiciary

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LAW ENFORCEMENT TECHNOLOGY

WEDNESDAY, MAY 17, 1995

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON CRIME,
COMMITTEE ON THE JUDICIARY,
Washington, DC.

The subcommittee met, pursuant to notice, at 9:38 a.m., in room 2154, Rayburn House Office Building, Hon. Bill McCollum (chairman of the subcommittee) presiding.

Present: Representatives Bill McCollum, Howard Coble, Steven Schiff, Fred Heineman, Steve Chabot, Bob Barr, Robert C. Scott, Melvin L. Watt, Zoe Lofgren, and Sheila Jackson Lee.

Also present: Representative John Conyers, Jr.

Staff present: Paul J. McNulty, chief counsel; Glenn R. Schmitt, counsel; Dan Bryant, assistant counsel; Aerin D. Dunkle, research assistant; Audray L. Clement, secretary; and Tom Diaz, minority counsel.

OPENING STATEMENT OF CHAIRMAN MCCOLLUM

Mr. MCCOLLUM. Good morning. This hearing of the Crime Subcommittee will come to order. We are this morning meeting in our neighboring government reform meeting room, and we are very appreciative of the chairman, Mr. Clinger, letting us have this for our hearing this morning. I see we have a good turnout and a good attendance, and a lot of folks interested in what we are doing today.

This morning we are holding an oversight hearing concerning law enforcement technologies. As the tragic events in Oklahoma City remind us, combating violent crime has become increasingly challenging in the 20th century. Modern technology has led to new criminal opportunities and methods and new ways of avoiding detection. Increased technological sophistication has opened the door to increased criminal sophistication.

At the same time, technological advances have helped improve the crime fighting capabilities of Federal, State, and local law enforcement agencies. New technologies have provided the law enforcement community with invaluable new tools, while improving efficiency and cutting costs. A wide range of technologies are now indispensable to fighting crime. Technologies involving automated identification information management and communications are relied on daily by law enforcement agencies throughout the country.

The Oklahoma City tragedy has illustrated the central role of technology in law enforcement today. It was a national automated information system that provided key information leading to the arrest of the suspect, Timothy McVeigh.

It is important to note that in an era of tight budgets, law enforcement is left trying to do more with less. Under such circumstances, it is vital that law enforcement be as smart as it can be. A wide range of technologies have greatly enhanced the ability of law enforcement to gather critical intelligence. Fiscal constraints also place a premium on the effective coordination of efforts within government and industry to identify and develop new law enforcement technologies.

For more than 25 years, the Justice Department's National Institute of Justice has provided important Federal leadership in the area of law enforcement technologies, identifying and supporting technological advances applicable to criminal justice. NIJ sponsored projects and research programs have focused on a wide range of technology issues, including DNA analysis and light weight police body armor.

Through its Office of Science and Technology, NIJ is currently facilitating efforts to develop less than lethal technologies that police can use in situations where lethal force is not justified, or would place bystanders at risk.

NIJ also coordinates with the Defense Department to ensure that certain technologies which have both military and law enforcement applications are identified and developed. This coordination effort leverages resources and has led to new tools for both the law enforcement community and the military.

In February 1995, this Congress recognized the valuable role of the National Institute of Justice in fighting crime and required that one percent of the total funding of the local government law enforcement block grants be set aside for use by NIJ to assist units of local government to identify, develop and purchase new law enforcement technologies.

I know I speak for all members of this subcommittee in stating my hope the National Institute of Justice will continue to work closely with industry to ensure that the law enforcement community can fully utilize emerging technologies in its fight against crime.

My friend from New York is not here this morning. But before I yield to Mr. Scott, if he wishes to make an opening statement, I would like to make a comment and recognize the continuing leadership of Mr. Schiff on this issue. In fact, it is largely due to his initiative that we are holding this hearing today.

At this point in time, I am going to yield to Mr. Scott if he wishes to make an opening statement, and then, certainly to Mr. Schiff.

Mr. SCOTT. I don't have an opening statement, Mr. Chairman. I appreciate the hearing this morning. It gives us an opportunity to use technology to catch the guilty. One of the problems we have in this criminal justice system is that innocent and guilty people get caught up in the same procedure. By the use of technology, we can more closely identify the guilty. We can catch the criminals.

DNA has been one area where the guilty have been very well separated from the innocent. Fingerprint identification systems have done the same thing in helping us catch criminals and without getting the innocent roped into the criminal justice system.

So I am looking forward to the technology that can help us fulfill this goal.

Mr. MCCOLLUM. Thank you, Mr. Scott. Mr. Schiff.

Mr. SCHIFF. Thank you, Mr. Chairman. I do have some brief remarks to make. The first is, to commend Congresswoman Patricia Schroeder, with whom I have worked regularly on this issue of bringing high technology to law enforcement.

Mr. Chairman, there has always been a discussion here in the Congress of what is the proper Federal role with respect to law enforcement. That is, what should we do here and what should State and local government be responsible for doing.

I think one area of improving law enforcement, where I think there is a very clear role for Federal leadership, is in developing high technology for law enforcement. All of our local police departments and sheriffs' departments and other agencies cannot possibly be expected to individually pay for the tests and examination of products and evaluation of their effectiveness.

It seems to me that that could be done at the Federal level through an organization like the National Institute of Justice, which has been doing this job for a number of years. Then, the Federal Government disseminating this information to the State and local governments so that they can make the appropriate purchases that fit their needs.

I think one of the greatest contributions that technology will make, along with many others of course, is in fact to law enforcement. I am going to mention just two, although obviously I and many people here could go on past that. One is DNA identification.

When I began as an assistant district attorney in 1972, my recollection is that blood analysis was limited to blood type and the Rh factor. You know, you are A positive or AB negative, or whatever it might happen to be, and that was it. Of course that limited a blood sample to tens of millions of people, even on the rarest of blood types.

Toward the time I was leaving law enforcement, at the end of the 1980's to come here, we had added the identification of different antigens. I believe there were six different antigens that could be identified, along with the different blood types and Rh factors. That narrowed it down considerably, but still left numerous possibilities of mistaken identity.

We now have what I don't believe existed only a few short years ago. That is, DNA identification, which can get a blood type and basically body fluid type identified almost down to a specific individual.

A second contribution is in nonlethal apprehension technology. We have had a number of incidents in the Albuquerque area which I represent, which I think are not unusual, where the police are confronted by an individual who may be armed with a gun or a knife, and the situation is that individual at that moment may be intoxicated or otherwise, not in possession of his right mind, as we would say. The fact of the matter is the police on those occasions have opened fire, because they were threatened. They were threatened by the individual concerned and had to protect themselves. But everybody, from the police to the citizens wished that there was a way to apprehend someone in that circumstance without fatally shooting them, because there is a belief that many of these individuals in other circumstances would not be dangerous.

We have a number of technologies offered here that may well do that. I did not name other technologies that are right in front of us, but they are there for everyone to see.

I have just two more brief things, Mr. Chairman. One is, I want to say there will be a demonstration of a number of technologies here after the hearing. Everyone is invited to stay. TRW will demonstrate an automated fingerprint identification system. DGE is what I have, has a remote consultation information system. Sandia National Laboratories in Albuquerque has a smart gun. That is, a firearm that can be used only by the person who is supposed to be able to use it. There are laser maxis dazzler and laser cited guns, and a number of other items to be demonstrated. I hope people will be able to stay.

Finally, Mr. Chairman, I have a unanimous consent request. That is, I ask unanimous consent that the record remain open for 5 days after this hearing, because a number of individuals wanted to testify who are not available today.

Mr. MCCOLLUM. Without objection, so ordered. Thank you very much, Mr. Schiff.

I would like to welcome our first panel of guests this morning. Our first witness is David Boyd. If you could come, Director Boyd, and have a seat and Chief McEwen.

David Boyd is the Director of Science and Technology for the National Institute of Justice, the criminal justice research and evaluation agency within the U.S. Department of Justice. Appointed in September 1992, Director Boyd oversees the Institute's initiatives to identify and develop new technologies and advance the effectiveness of law enforcement agencies.

He is also responsible for the Institute's technology assessment program which with the assistance of major law enforcement and criminal justice practitioners, identifies priorities for the establishment of standards and testing for law enforcement equipment.

Our next witness will be Harlin McEwen, a 37-year veteran in law enforcement and chief of police in Ithaca, NY. Chief McEwen has been a member of the National Institute of Justice's Law Enforcement Technology Advisory Council since 1978, and has served as the Council's Chairman since 1989. The Council reviews technology efforts on behalf of law enforcement, to ensure that the practical considerations of the beat officer are taken into account in the development of new technologies.

I want to welcome both of you here today. Director Boyd, if you would proceed, we would appreciate it.

STATEMENT OF DAVID G. BOYD, DIRECTOR, SCIENCE AND TECHNOLOGY DIVISION, NATIONAL INSTITUTE OF JUSTICE, U.S. DEPARTMENT OF JUSTICE

Mr. BOYD. Well, thank you, Mr. Chairman and members of the subcommittee. I want to express, in particular, our appreciation for your support and that of Mr. Schumer and others of the conference just concluded.

As you know, today was to have been a panel on the role of government in helping us to do these kinds of things. So the level of interest you can see by the number of folks behind me who decided to remain over and attend this hearing. We could not think of a

better alternative to our panel on the role of government than this hearing.

Mr. MCCOLLUM. We certainly appreciate everybody who came and stayed. That's terrific. I'm very happy for that. Thank you.

Mr. BOYD. Thank you, sir. Every year, more than 23,000 Americans are murdered, more than 170,000 are raped, more than 6 million are victims of assault and at least 13 million are victimized by property crimes. The total economic cost of crime in this country in a single year comes to a staggering \$70 billion.

Since 1988, investment in law enforcement and the criminal justice system has grown at roughly twice the rate of all other government spending, until as a nation, we now spend more than \$75 billion each year. We spend another \$50 billion on private security agencies and untold amounts to protect our homes and businesses. In December of last year, Business Week magazine put the annual total cost at a much higher level, at least \$425 billion.

Yet despite the incredible cost of law enforcement and the clear expressions of concern by citizens about the consequences to the public of crime, we have done little to modernize our primary crime-fighting instrument, the Nation's police. In fact, State and local police are still equipped much as was Wyatt Earp in the late 19th century.

If we could reduce crime by only 1 percent, it would mean 230 fewer murders, more than 1,700 fewer rapes, 60,000 fewer assaults, and at least 130,000 fewer property crimes. It would mean a savings of at least \$700 million in economic costs, savings that would be realized every year.

If we had available technologies which eliminated the need for high speed pursuits, we could save our cities huge tort losses. New York City recently lost a judgment for over \$100 million, for injuries to an innocent child struck by a motorcyclist being pursued by police. That is more than 50 times the total annual research and development budget allocated to the National Institute of Justice for the development of technologies to address this very issue.

In 1992, in California alone, there were more than 7,000 high-speed pursuits, which resulted in more than 1,200 injuries. Fully 14 percent of those injuries were to law enforcement personnel, and 15 percent were to innocent bystanders. Nationally, about 1 percent of all high-speed pursuits end in fatalities.

If we could find a technology that would safely and effectively permit an alternative to incarceration for just 1 percent of our current prison population, it would save at least \$159 million each year, not counting the cost of prisons themselves.

While there may be limits to the amount of improvement technology is capable of producing in the levels of crime, the promise of productivity improvements offered by technology is clear. The numbers are impressive and the need compelling.

From 1970 to 1991, crimes per police officer increased more than 65 percent. Some argue the real figure is more like 500 percent. This workload increase is reflected in the rate at which crimes are now cleared. In 1993, fewer than 20 percent of all reported property crimes, barely one-fifth, were cleared within 1 year. The clearance rate for murder declined from 91 percent in 1965 to barely 65

percent in 1992. The robbery clearance rate in 1993 was only 24 percent.

In 1950, every police officer handled fewer than three serious crimes a year. Today, despite the fact that we have more than doubled the number of officers in the United States, every officer is faced with more than nine times that number of crimes. In 1950, only 36 officers were killed in the line of duty. Today, we average 150 a year, 157 last year. The number is that low only because soft body armor saves another 150 each year.

If we could improve the productivity of the entire law enforcement and criminal justice system by just 1 percent, it would be equivalent to investing at least an additional \$750 million in law enforcement. That is roughly equivalent to the cost of putting an additional 15,000 officers on the streets.

Unfortunately, our efforts to leverage technology to obtain those productivity improvements have hardly been reassuring. From 1985 to 1990, total Federal research and development investment increased nearly 8 percent. During the same period, crime increased more than 30 percent, while the number of criminals incarcerated rose by 60 percent. Yet investment in research and development for the entire law enforcement and criminal justice system actually declined 19 percent over the same period.

As you are all aware, NIJ is the Department's principal research and development component. In that capacity, NIJ supports State, local, and Federal law enforcement agencies by providing and encouraging research and demonstration efforts aimed at improving the effectiveness of all elements of State, local and Federal criminal justice systems and related aspects of the civil justice systems. In fact, NIJ's legislative charter requires the Institute to give primary emphasis to the problems of State and local justice systems. That makes a lot of sense, because supporting the smaller agencies is the crucial challenge. More than 90 percent of the roughly 17,360 law enforcement agencies in the United States employ 24 or fewer sworn officers. Half employ fewer than 12. Yet these tiny agencies account for 95 percent of all law enforcement personnel in the United States, and the vast bulk of what we consider policing falls within their local jurisdictions.

Federal agencies are rarely the first on the scene for those problems the average citizen is most concerned about: domestic disturbances, rapes, assaults, murders, gang brawls, drive-by shootings, burglaries, carjackings, robberies and the like. While Federal agencies are involved in a dozen or so hostage barricade or barricade operations each year, the New York City police alone are called out to confront this kind of problem several hundred times each year.

Over 90 percent of prison inmates and all jail inmates are held in State and local facilities. In fact, the largest Federal facilities, which rarely house more than 2,000 prisoners, are dwarfed by the Los Angeles County Jail, which houses over 20,000. If we want to have an impact on crime, we'll have to support law enforcement at the State and local level by helping to provide technological force multipliers.

Despite a budget that has rarely exceeded \$3 million, and a staff that only recently grew to five, we have had a remarkable impact on law enforcement technology over the years. Almost all the foren-

sic DNA research done in the United States has been funded in whole or in part by the National Institute of Justice. If you watch the O.J. Simpson trial, you have seen Judge Ito leafing through this book, "DNA Technology in Forensic Science." It was produced by the National Academy of Sciences at our request, and we funded it.

I should here point out that NIJ funds the Office of Law Enforcement Standards within the National Institute of Standards and Technology, so that we can capitalize on those laboratory facilities and that expertise without having to build our own laboratory. They produce the standard reference materials kit used by DNA laboratories to help assure reliable results with the most commonly used DNA identification process. That kit was recognized in 1993 by Research and Development magazine as one of the 100 best research and development projects in the United States.

We have just completed and will shortly offer for sale, this standard materials kit for a new DNA technology which can produce results in a day at a cost of about \$30 per test, instead of the 6 to 8 weeks and \$300 to \$600 required by the current most commonly used method.

We have also been tasked by the Attorney General with the management of efforts to enhance the DNA capabilities of qualified State and local laboratories. Congress has tasked us with the development of a way to ensure the accuracy of DNA identification by laboratories.

Working with the FAA some years ago, we demonstrated the value of the metal detectors you now find in airports and of drug-sniffing dogs. We developed, produced and demonstrated the soft body armor worn today by most of our police, a technology which has so far saved more than 1,800 police officer lives. In addition to the obvious human benefits of this technology, the economic savings have been remarkable.

Every officer killed in the line of duty costs the taxpayer about \$1 million in survivor benefits, training and replacement costs, for total return to date of more than \$1.8 billion on a barely \$5 million investment.

Today there is an international body armor industry dominated by the United States. We also test, monitor and certify the performance of those vests so that State and local agencies can be confident that what they are buying really works as advertised. We are sort of a consumer products reports for law enforcement, providing the only objective comparisons of manufactured equipment for law enforcement: new police car packages and tires each year, police weapons, handcuffs and other equipment.

At the request of our Law Enforcement Technology Advisory Council, we conducted the Nation's only comprehensive investigations into the effectiveness and safety of pepper spray. In the course of that effort, we found that pepper spray was not a proximate cause of any death we examined, but that positional asphyxia probably accounted for nearly 80 percent of the in-custody deaths we looked at. Because of that finding, police have begun to change restraint methods to eliminate positional asphyxia as a cause of death.

We are, in short, the only unbiased technology information service for most State and local agencies. We are the only research and development activity focused by law directly on State and local law enforcement and corrections needs.

In the past year, responding to recommendations by the law enforcement community, we created the National Law Enforcement and Corrections Technology Center to administer voluntary standards for selected law enforcement equipment and manage voluntary certification programs. Under these programs, participating industries pay all the testing costs, while we certify the laboratories and ensure the integrity of the testing.

The Center will develop critical product data bases for law enforcement, which include such information as who manufactures what, what the points of contact are, how well the products perform, and what other law enforcement agencies use the product and can discuss its effectiveness. The Center will evaluate products such as police car packages, tires, and pepper spray. It will help law enforcement agencies locate essential equipment that may be too expensive or too specialized to own, but which may be needed on an occasional basis. It will collect law enforcement needs and requirements information for use by industry in developing affordable technologies for law enforcement.

Regional centers are also being established to bring these capabilities closer to the agencies they support and to make them more responsive. Each center is located at a facility which has agreed to support the center with free space or other assets. Each is developing a core functional competency. The Western Regional Center, for example, is located in an excess Air Force building, while the Southeastern Regional Center is located in an excess Navy building.

At the same time, we have begun at your direction, to establish a technology information network to better support State and local law enforcement agencies by providing the means which will enable access by law enforcement to all the services of the centers.

Even though the centers have only begun to be established last October, and the last center is not fully on line yet, the system has already provided technical assistance to more than a dozen major criminal investigations around the United States, which required technologies or capabilities otherwise unavailable to the investigating agency. The Western Center has helped solve the murder of a police officer and produced the first leads in a 7-year-old serial rape case in Delaware, using advanced technologies developed to support our intelligence services.

We responded to more than 1,500 requests already this year for technical information, and distributed nearly 7,000 documents in response to those requests, an increase of more than 250 percent over last year.

We have also established a partnership with the Department of Defense, so we can find ways to leverage research and development investments already made by the taxpayers. Both the FBI and the Bureau of Prisons have joined in this effort by helping NIJ staff the Joint Program Steering Group. This group has been charged by Congress with the management of the operations other than war law enforcement program with ARPA, and is required to identify

and develop projects which meet both military and law enforcement needs. In South Carolina, we are initiating a major pilot project to enhance law enforcement access to useful surplus Federal property.

Interestingly, the first successful transfers of technologies between Defense and Justice have both been from Justice to Defense. U.S. military forces relied on NIJ soft body armor standards in purchasing ballistic armor for troop use in Somalia. More recently, NIJ transferred the sticky foam delivery systems developed over the past 2 years at Sandia National Laboratories to the U.S. Marine Corps for use during the withdrawal of U.N. forces from Somalia. You will see some of that in that awful looking pile on the table. I encourage people not to touch the gooey stuff. It stays sticky, the scientists tell us, forever.

In March, NIJ initiated three projects, each based on a different technology, to develop new devices to detect concealed weapons. Our goal is to produce affordable devices, possibly hand held, which can detect weapons without false alarms. The Department of Defense is initiating another project based on at least one additional technology. Both of these efforts are extraordinarily well coordinated since both the NIJ and Defense projects share the same program manager, provided by NIJ.

In March, working with the U.S. attorney's office in San Diego, the Office of National Drug Control Policy, the Treasury Department in the city of San Diego, we opened the Border Research and Technology Center to provide a test bed for border control and contraband detection technologies.

There obviously is no 1-to-1 relationship between investments in technology and reductions in crime or improvements in police productivity. But law enforcement is probably the one area where the greatest gains from technology can be realized, not because law enforcement is particularly responsive to technology, but because so little has been invested in bringing technology to State and local law enforcement.

For example, the current best fingerprinting method for nonporous surfaces often requires a laboratory. If the prints are on major fixtures, such as bathtubs and large windows, the fixtures may have to be ripped out and trucked to the laboratory. But now a new device, roughly the size of a small flashlight, that we developed last year under an NIJ grant, allows fingerprints to be developed in a matter of seconds on site in a single step. This project was conceived, developed, tested, transferred to industry, and turned into a commercial product in barely 18 months, with a total research and development investment of less than \$100,000. Announced in February 1994, at least 100,000 units have already been sold, and at least 100,000 more were backordered by June of last year.

An automated booking system implemented recently by the Drug Enforcement Administration is capable of reducing booking time from 75 to 15 minutes, a savings of 80 percent for that single function.

Paradoxically, it is in law enforcement, probably the most poorly funded area of research and development, that leveraging technology is most promising and can probably pay the greatest and

most immediate dividends. The potential for payoffs in technology at the patrol officer level are nearly unlimited.

In contrast with the Department of Defense, there is no Federal level agency driving the development, manufacture or acquisition of specialized law enforcement equipment. Law enforcement equipment purchases instead are made by the members of an intensely fragmented market. As a consequence, although this market, with nearly 3 million potential individual customers, is large enough to sustain an industry, it lacks the resources to support the research and development base needed to create the new products it needs. In fact, with the possible exception of soft body armor, handcuffs and batons, there are virtually no products developed exclusively for law enforcement use. But we may finally be changing that.

The Aerospace Corp. in El Segundo, CA, has created a self-funded public safety division. Kodak is creating an Institute for Forensic Imaging in Indiana. Sandia and Idaho National Engineering Laboratories have both created strong partnerships with State and local law enforcement agencies in their States, and have been major partners of ours. The University of California, Riverside, is bringing the County Crime Laboratory onto campus, and creating a new Law Enforcement Engineering Center. Oak Ridge National Laboratories is now establishing a Center for Applied Science and Technology for Law Enforcement, and has already provided support essential to solving crimes in Tennessee. Westinghouse has established a major law enforcement division in Florida, and there are many others. All of these, at our urging, are forging strong bonds with local agencies and providing kinds of support never before available to these agencies.

We know technology cannot fix every shortcoming. We know it can't make up for poor judgment, or compensate for inadequate or nonexistent training. It can't fix the problems that result from poor officer screening or selection, and it can never replace competent leadership. But it can provide tools to increase options, make the police officer's job easier, increase the effectiveness of law enforcement, enhance productivity in law enforcement by reducing administrative overhead and improving responsiveness, limit the consequences of poor judgment, and improve the safety of the police and the public. Technology can save lives.

Mr. Chairman, I would be happy to respond to any questions the subcommittee might have.

[The prepared statement of Mr. Boyd follows:]

PREPARED STATEMENT OF DAVID G. BOYD, DIRECTOR, SCIENCE AND TECHNOLOGY
DIVISION, NATIONAL INSTITUTE OF JUSTICE, U.S. DEPARTMENT OF JUSTICE

Mister Chairman, Members of the Subcommittee:

I am pleased to have this opportunity to appear before you and discuss the technology efforts of the Department of Justice's National Institute of Justice (NIJ).

As you are all aware, NIJ is the Department's principal research and development component. In that capacity, NIJ supports state, local, and federal law enforcement agencies by providing and encouraging research and demonstration efforts aimed at improving the effectiveness of all elements of state, local and federal criminal justice systems and related aspects of the civil justice systems. In fact, NIJ's legislative charter requires "the Institute [to] give primary emphasis to the problems of State and local justice systems."¹ As NIJ Director Jeremy Travis has observed, "State and local governments spend more than six times as much on all justice activities in a year as the federal government. They convict almost seventy times as many criminals, and hold nine times as many prison inmates."²

For the past quarter of a century NIJ's focus has been on meeting the needs of state and local law enforcement agencies. Yet we have also supported and will continue to support federal law enforcement, because those agencies provide crucial services which bridge jurisdictional barriers at the state and local levels.

We are the agency that first brought the foundation technologies to the United States that made DNA identification possible. In fact, almost all the forensic DNA research done in the United States has been funded in whole or in part by the National Institute of Justice. This includes the Standard Reference Materials Kit produced under the Office of Law Enforcement Standards which exists within the National Institute of Standards and Technologies, but which is funded by the National Institute of Justice. That kit is used by DNA laboratories to help assure reliable results with the current and most commonly used DNA identification process and was recognized in 1993 by *Research and Development Magazine* as one

of the 100 best research and development projects in the United States. Just recently, we completed a new standard for a new DNA technology (Polymerase Chain Reaction) which can produce results in a day at a cost of about \$30 per test instead of six to eight weeks and \$300 to \$500 required by the current more commonly used method (Restricted Fragment Length Polymorphism). NIJ has also been tasked by the Attorney General with the management of efforts to enhance the DNA capabilities of qualified state and local laboratories to ensure they are capable of supporting and taking advantage of the FBI's CODIS data base, while Congress has tasked us with the development of a way to ensure the accuracy of DNA identifications by laboratories.

We're the agency which, working with the Federal Aviation Administration, demonstrated the value of the metal detectors you now find in airports, of drug sniffing dogs, and a broad variety of techniques for the identification of forgeries. We're also the agency which developed, produced and demonstrated the soft body armor worn today by most of our police - a technology which has so far saved more than 1,800 police officer lives.³ We're the agency which tests, monitors and certifies the performance of those vests so that state and local agencies can be confident that what they're buying really works as advertised. We're sort of a "Consumer Reports" for law enforcement, providing the only objective comparisons of manufactured equipment for law enforcement: new police car packages and tires each year, police weapons, handcuffs and other equipment. We're the agency which, when law enforcement asked us to determine whether pepper spray was really safe, conducted the nation's only comprehensive investigations into its effectiveness and safety. And in the course of that effort, we found that while pepper spray was not the proximate cause of any death we examined, we were able to establish that positional asphyxia accounted for nearly 80% of the in-custody deaths we examined.⁴ Because of that finding, police have begun to change restraint methods to eliminate positional asphyxia as a cause of death. We are, in short,

the only unbiased technology information service for most state and local agencies, a crucial function in support of our more than 17,000 state and local law enforcement agencies who can ill afford to pull officers off the street to search for product information. Fully 90% of those agencies employ fewer than 24 sworn officers, and half fewer than 12. And we are the only research and development activity focussed - by law - directly on state and local law enforcement and corrections needs.

In the past year, the National Institute of Justice, responding to recommendations by the law enforcement community, has converted the Technology Assessment Program Information Center (TAPIC) into the National Law Enforcement and Corrections Technology Center, which:

- Working with the Office of Law Enforcement Standards, establishes voluntary standards for selected law enforcement equipment and manages voluntary certification programs. Under these programs, participating industries pay all the testing costs, while NIJ certifies the laboratories and ensures the integrity of the testing.
- Develops critical product data bases for law enforcement which include such information as: who manufactures what, what the points of contact are, what testing or evaluation information is available, and what other law enforcement agencies use the product and can discuss its effectiveness.
- Assists law enforcement in understanding what technologies are available, how they can be used, and what advantages they offer.
- Makes available information on successful local funding strategies for new technologies.
- Evaluates products, such as police car packages, tires and pepper spray.
- Helps law enforcement agencies locate essential equipment that may be too expensive or too specialized to own, but which may be needed on an occasional basis.

- Conducts field demonstrations of new law enforcement technologies.
- Collects law enforcement needs and requirements information for use by industry in developing affordable technologies for law enforcement.

Regional centers are also being established to bring these capabilities closer to the agencies they support and to make them more responsive. Each center is located at a facility which has agreed to support the center with free space or other assets and each is developing a core functional competency. The Western Regional Law Enforcement Technology Center, for example, is already working with law enforcement agencies as far away as Delaware to apply imaging technologies to solve crimes. That center, which occupies an excess building at the Aerospace Corporation - a fully funded Air Force Research and Development Center - has already been critical in the solution of the murder of a police officer, various robberies, arsons, and other crimes. The Southeastern Regional Law Enforcement Technology Center is concerned with corrections technologies and is also located in an excess government owned building.

At the same time, we have begun to establish a Technology Information Network to better support state and local law enforcement agencies by providing ready access to a network which will enable access by law enforcement agencies to all the services of the centers. The Technology Information Network is supported on a Navy owned system and will link to a variety of other technology information systems. It is also supporting the completion of the Regional Information Sharing System (RISS) network and will be able to share equipment information with RISS member agencies.

Even though the centers only began to be established last October and the last center is not fully on line yet, the system has already:

- Provided technical assistance to more than a dozen major criminal investigations around the

United States which required technologies or capabilities otherwise unavailable to the investigating agency.

- ♦ Responded to more than 1,500 requests for information and distributed nearly 7,000 documents in response to those requests - an increase of more than 250% over last year.
- ♦ Provided information to the field on the truth about the "Rhino" and "Black Rhino" bullets. Within 24 hours of the press announcement of those bullets, the NIJ National Law Enforcement Technology Center, working with the FBI and ATF, was able to post accurate information on every major commercial on line computer service in the United States and defuse most law enforcement and press concerns.
- ♦ Published the first two issues of Technology Beat (intended as a brief, monthly newsletter to the field about new developments in law enforcement technologies), the 1995 police car package test results, a bulletin on pepper spray, a new body armor user guide, a 1994 patrol vehicle tire test report, and distributed more than 30,000 documents to the field.
- ♦ Provided technology exhibits in Albuquerque, New Mexico; Seattle, Washington; Oakland, California and New York City.

We have also established a partnership with the Department of Defense so we can find ways to leverage research and development investments already made by the taxpayers. Both the Federal Bureau of Investigation and the Bureau of Prisons have joined in that effort by helping NIJ staff the Joint Program Steering Group with the Advanced Research Projects Agency (ARPA). This group has been charged by Congress with the management of the Operations Other Than War/Law Enforcement program with ARPA, and is required to identify and develop projects which meet *both* military and law enforcement needs. And in Charleston, South Carolina, we are initiating a major pilot project to see if

we can develop more effective ways to locate, secure and transfer federal property useful to law enforcement. That effort has already helped us obtain for the South Carolina State Law Enforcement Division special covert marking equipment so they can reliably and safely distinguish, during the hours of darkness, their own aircraft from aircraft they have under surveillance. Interestingly, the first successful transfers of technologies between Defense and Justice have both been *from Justice to Defense*. U.S. military forces relied on NIJ soft body armor standards in purchasing ballistic armor for troop use in Somalia and, more recently, NIJ transferred the sticky foam delivery system and devices developed over the past two years to the U.S. Marine Corps for use during the withdrawal of UN forces from Somalia.

Probably the most striking example of cooperation in this effort is our concealed weapons detection initiative. In March, NIJ initiated three major projects - each based on a different technology - to develop new devices to detect concealed weapons. Our goal is to produce affordable devices, possibly handheld, which can detect weapons without false alarms. The Joint Program Steering Group will shortly initiate another project, based on at least one additional technology. Both of these efforts are extraordinarily coordinated. Both the NIJ and ARPA projects share the same program manager, provided by NIJ. All of the technologies will be supported through several critical stages of development. Systems integration - turning the technologies into real products - will be managed by NIJ's National Law Enforcement and Corrections Technology Center located at Rome Laboratories. Technical and safety testing and evaluation will be performed at NIJ's National Law Enforcement and Corrections Technology Center located at Naval In-Service Engineering in Charleston, South Carolina, while imagery analysis support will be provided by NIJ's National Law Enforcement and Corrections Technology Center located at Aerospace in El Segundo, California. Countermeasures analysis - determining how each technology can

be defeated and what we will need to do to prevent those measures - will be performed by Sandia National Laboratories in New Mexico, while our Office of Law Enforcement Technology Commercialization, co-located with the National Technology Transfer Center, will help us move the finished technologies out into the market place.

But we're only a small part of efforts to address a very large problem.

Every year, more than 23,000 Americans - nearly half the total number killed in the entire Vietnam War - are murdered. More than 170,000 are raped, and more than 6 million are victims of assaults. At least thirteen million are victimized by property crimes while about 1.5 million victims of violent crime are treated by our health care systems. The total economic cost of crime in this country - in a single year - comes to a staggering \$70 billion!⁵

It should come as no surprise then that the American public consistently ranks crime at the top of every list of serious threats facing the country.

Since 1988, investment in law enforcement and the criminal justice system has grown at roughly twice the rate of all other government spending, until as a nation, we now spend more than \$75 billion each year on the law enforcement and criminal justice systems.⁶ At the same time, we spend another \$50 billion on private security agencies and untold amounts on often unsuccessful efforts to protect our homes and businesses.⁷

Yet, despite the incredible cost of law enforcement and the clear expressions of concern by citizens about the consequences to the public of crime, we have done little to modernize our primary crime-fighting instrument -- the nation's police. In fact, state and local police, who represent more than 95% of our nation's police personnel and handle well over 95% of the crime in this country, are still equipped much as was Wyatt Earp in the late 19th century. Surely, America's highly sophisticated

technology base can provide better alternatives and make our thin blue line more effective at the same time.

If we could reduce crime by only one percent, it would mean 230 fewer murders, more than 1,700 fewer rapes, 60,000 fewer assaults and at least 130,000 fewer property crimes. It would mean 15,000 fewer victims of crime burdening our already hard pressed health care systems, and it would mean a savings of at least \$700 million in economic costs -- savings that would be realized every year.

If we had available technologies which eliminated the need for high speed pursuits, we could save our cities huge torts losses. New York City recently lost a judgment for injuries to an innocent child (struck by a motorcyclist being pursued by police) for over \$100 million - more than 50 times the total annual research and development budget allocated to the National Institute of Justice for the development of technologies to address this very issue! In 1992 in California alone, there were more than 7,000 high speed pursuits, which resulted in more than 1,200 injuries. Fully 15% of the injuries were to innocent bystanders, while 14% were to law enforcement officers. Nationally, about 1% of high speed chases end in fatalities.⁸

If we could find a technology that would safely and effectively permit an alternative to incarceration for only 1% of our current prison population, it would save at least \$159 million each year.⁹

If we had available tools to reduce the consequences of violence in confrontations between police and suspects, what could they save us? We have no certain way of knowing, but we do know that without them, nearly 300 suspects will be killed each year, despite the best efforts of police to avoid bloodshed, and more than 150 police officers will die in the line of duty.¹⁰

While there may be limits to the amount of improvement technology is capable of producing in the levels of crime, the promise of productivity improvements offered by technology is clear, the numbers

are equally impressive and the need compelling. From 1970 to 1991, crimes per police officer increased more than 65%, a workload increase that is reflected in the rate at which crimes are now cleared.¹¹ In 1993, fewer than 20% of all reported property crimes - barely one fifth - were cleared within one year. While the numbers are better for violent crimes, they still aren't very promising: only 45% -- less than half -- of all violent crimes are cleared each year. The clearance rate for murder has declined steadily since 1965, from 91% to 65% in 1992 and the robbery clearance rate in 1993 was only 24%. Since there are limits to the resources we can apply to law enforcement, finding newer, more effective ways to improve the productivity and effectiveness of policing is essential.

Unfortunately, our efforts to leverage technology to obtain those productivity improvements have hardly been reassuring. From 1985 to 1990, total federal research and development investment increased 7.8% in inflation adjusted dollars. During the same period, crime increased 31.4% while the number of criminals incarcerated rose by 60%. Yet investment in research and development for the law enforcement and criminal justice system declined 19% over the same period. In other words, as the problem got worse, we invested even less in building better tools and finding solutions.¹²

Part of the problem is a perception that law enforcement already has access to advanced technologies. Because federal agencies have access to advanced technologies, we tend to assume the same tools are available at the local level. At the same time, television programs often suggest that police have lots of fancy equipment they can deploy at appropriate times. Unfortunately, most of this equipment is actually unavailable to local law enforcement or is far less sophisticated or effective than portrayed. Even the technology which really does exist is rarely available to any but the largest departments, and then is usually drawn from military equipment only marginally suited for law enforcement uses. Most technology in state or local law enforcement agencies is hand-me-down, generations old, technologically obsolescent

military equipment (night vision devices, radio systems, etc.). And much of the technology developed for Federal agencies is either classified, is concentrated primarily on automation or surveillance technologies, or is available only in very small quantities. Very little has been developed with the patrol officer in mind.

In most state and local law enforcement agencies, the research and development operation - when there is one - is someone charged with going through equipment catalogs to find modern, affordable equipment. Even among federal agencies, those offices referred to as research and development are almost entirely applications oriented activities, building or adapting one-of-a-kind surveillance devices tailored to the specific operational requirements of a single agency. What has been missing is a genuine research and development effort focused specifically on law enforcement, corrections and public safety needs, especially at the state and local level. Such an effort is needed because military technologies, while well suited to reactive strategies, usually require significant adaptation to be made suitable for the kind of *proactive* strategies we want to see put in place.

Since funding is so limited, law enforcement research and development projects tend to be very small and progress very slow.¹³ At the national laboratories, where some of the work is being done, law enforcement projects are part time work, sandwiched in among major, multimillion dollar projects. In industry, where most of the work is being done, it is difficult to attract high-powered talent and it is even harder to develop the critical mass required to make significant breakthroughs. Most major defense companies have not been successful in entering and staying in the law enforcement market, because they have not yet learned to work with so extraordinarily fragmented a market. More than 90% of the roughly 17,360 law enforcement agencies in the United States employ 24 or fewer sworn officers and most departments make all purchases independently.

This fragmentation discourages the entry of major industry into the field, yet the potential market is very large. Police and Sheriffs' departments collectively employ nearly 840,000, while corrections agencies employ approximately 400,000. The private security industry is the real heavyweight in terms of employment, with more than 1.5 million, while fire and rescue agencies - which could use much of the technology needed by law enforcement - account for another 340,000 employees. These numbers are large enough to support vibrant markets, but - unfortunately - are not large enough to support much research and development overhead.¹⁴

Why do we dwell on these numbers? Because supporting the smaller agencies - over 90% of all our law enforcement agencies - is the crucial challenge. The truth is that 95% of all law enforcement manpower is state and local and the vast bulk of what we consider policing falls within *local* jurisdictions. Federal agencies are rarely the first on the scene for those problems the average citizen is most concerned about - domestic disturbances, assaults, murders, gang brawls, drive-by shootings, burglaries, carjackings, robberies and the like. While federal agencies are involved in a dozen or so hostage/barricade or barricade operations each year, the New York City police alone are called out to confront this kind of problem several *hundred* times each year! The corrections picture is not much different. Over 90% of prison inmates - and all jail inmates - are held in state and local facilities.¹⁵ In fact, the largest federal facilities - which rarely house more than 2,000 prisoners - are dwarfed by the Los Angeles County Jail which houses over 20,000! If we want to have an impact on crime, we'll have to support law enforcement at the state and local level by helping to provide technological "force multipliers". That is what prompted the Vice President to declare this past April that "[i]t is high time that we put the most advanced technology and the best new approaches at the disposal of police officers and other law enforcement officers throughout this country."

There obviously is no one-to-one relationship between investments in technology and reductions in crime or improvements in police productivity. But law enforcement is probably the one area where the greatest gains from technology can be realized, not because law enforcement is particularly responsive to technology, but because so little has been invested in bringing technology to state and local law enforcement. Examples of what can be accomplished with limited resources and accurate identification of law enforcement requirements include:

- ♦ The introduction of soft body armor by the National Institute of Justice. This technology, developed with an investment of barely \$5 million, has already saved well over 1,800 police officer's lives at an estimated savings in survivor's benefits and replacement costs of more than \$1 million per officer saved (for a total of more than \$1.8 billion), and resulted in the creation of an entire industry dominated by the United States;
- ♦ The current best fingerprinting method for nonporous surfaces requires a two-step process. First, cyanoacrylates (super glue) are fumed over the suspected area and then a dye is applied to make the prints visible. If the prints are on major fixtures, such as bathtubs or large windows, the fixtures may have to be ripped out and taken to the laboratory. But a new device, roughly the size of a small flashlight, developed last year under an NIJ grant, now allows the prints to be developed in a matter of seconds, on site, in a single step. In fact, this project was conceived, developed with the support of the Alaska Crime Lab, tested, transferred to industry and commercialized in barely 18 months with a research and development investment of less than \$100,000. Announced in February, 1994, this device was featured on CNN Science and Technology week and was priced - as a complete kit - at less than \$150. By June at least 100,000

units had been sold by the manufacturer and at least 100,000 more were backordered. The device requires little training to operate, and competitors have already entered the market and forced the price down; and

- An automated booking system implemented recently by the Drug Enforcement Administration is capable of reducing booking time from 75 to 15 minutes - a savings of 80% for that single function.

Paradoxically, it is in law enforcement - probably the most poorly funded area of research and development - that leveraging technology is most promising and can probably pay the greatest and most immediate dividends. The potential for payoffs in technology - at the patrol officer level - are nearly unlimited. Is it, for example, possible for technology to make stolen weapons unusable or prevent the deaths each year of hundreds of children in firearms accidents?¹⁶ Can we find better ways of tracking suspects? Can we tell what is in a fleeing felon's car, or in a suspect's house? Can we find a face or an armed subject in a crowd? Can we detect an armed student or other persons entering a school? Can we produce small, easy-to-use, inexpensive explosive sniffers or chemical detection equipment? Can we, without injury to the suspect, any hostage or innocent bystanders, subdue a suspect in a hostage/barricade situation or domestic disturbance; a fleeing vehicle or on foot¹⁷; a one-on-one confrontation with an armed but deranged subject; a carjacking; or a resisted search or drug raid? Can we develop safer methods of extracting an uncooperative prisoner from his cell?¹⁸ Can we provide safer, more effective and socially acceptable ways to control unruly crowds or quell riots? Can we provide better, more sophisticated training for law enforcement personnel at all levels, from officer to chief?

In contrast with the Department of Defense, there is no federal level agency driving the development, manufacture or acquisition of specialized law enforcement equipment. Law enforcement equipment

purchases, instead, are made by the members of an intensely fragmented market. As a consequence, although this market - with nearly 3 million potential individual customers - is large enough to sustain an industry, it lacks the resources to support the research and development base needed to create the new products it needs.¹⁹ In fact, with the possible exception of soft body armor, handcuffs and batons, there are virtually no products developed exclusively for law enforcement use.²⁰

Until recently, the role of the National Institute of Justice has been primarily one of funding the development of promising technologies in a few key areas. Only in the past three years has it also become one of identifying existing technologies (especially in the Defense and Intelligence communities), encouraging promising new concepts and facilitating the transfer of already developed technologies to law enforcement use.

By late 1992 and early 1993 a series of grants, cooperative agreements and interagency agreements had been initiated by NIJ in an effort to form a broad based technology identification, development and transfer program which has focused from the beginning on the practical needs of the user community. State and local law enforcement, as well as corrections departments and other users have been and continue to be included as *the* essential components of the NIJ technology team. To ensure that policy and human factors issues are properly addressed in the collection and analysis of background data on use of force by law enforcement personnel, and to ensure that these issues are properly represented in considering technology development for law enforcement, social scientists and criminal justice researchers are also included as part of the NIJ technology team.

Since funding for the development of technologies for law enforcement is severely limited, NIJ has been working to leverage research and development efforts by industry and other federal agencies. To start the search for new technologies NIJ turned to the vast technical expertise that exists within the

Department of Energy National Laboratories, particularly in the special technologies programs at the facilities charged with development of technology for intelligence gathering and the safeguarding of nuclear materials. At the same time, NIJ began aggressive efforts to identify military and intelligence community technologies that may be candidates for dual use under the Administration's Defense Technology Reinvestment Initiative announced early in 1993. Although the future of that program is uncertain, it is useful to observe that the panel concerned with law enforcement technologies (Operations Other Than War/Law Enforcement) received more than 175 proposals in 1994 with an aggregate value of more than \$300 million.

Spearheading the dual use technology effort is a distinguished panel established under a National Institute of Justice cooperative agreement which has been charged with establishing links essential to identifying and transferring dual use technologies. Directed by Vice Admiral (retired) E.A. Burkhalter, Jr., the panel includes Judge William Webster, former Director of the FBI and CIA; Jim Falk, former White House Counsel; Dr. Ruth Davis, former Assistant Secretary of Energy; General (retired) Paul Gorman, former Commander-in-Chief, U.S. Southern Command; Dr. David Mann, former Assistant Secretary of the Navy; Mayor Kurt Schmoke of Baltimore; Admiral (retired) Paul Yost, former Commandant of the U.S. Coast Guard; Ray Havens, Deputy Director of the U.S. Marshal's Service; and a number of active Federal officials from the Department of Defense, Intelligence Community Management Staff, FBI, Bureau of Prisons, U.S. Marshal's Service and metropolitan police departments.

Tying it all together is the Law Enforcement Technology Advisory Council (LETAC), funded by a cooperative agreement from NIJ and chaired by Chief Harlin McEwen of Ithaca, New York. This council is made up of more than 85 senior state, local and federal law enforcement officials from the United States and Canada. LETAC reviews technology efforts on behalf of law enforcement to ensure they are

well grounded in the very real world of the police officer. We are already creating regional councils at each of the NIJ technology activities around the country in order to broaden the base of participation of state and local law enforcement in our efforts.

At the same time, we have started a major effort to identify what it will take to get new technologies introduced to the community by creating three other groups: a liability task group, community acceptance panel, and an industry panel.

The Liability Task Group is constituted of private, municipal and law enforcement attorneys, retired judges, and law school faculty and students. This task force is charged with identifying liability issues and recommending efforts law enforcement agencies should undertake to address them, both before and after new technologies are introduced.

The Community Acceptance Panel is key to getting any technology into the field. It is made up of a wide range of community groups and is charged with helping to identify "show stopper" community issues that might surround a newly developed or developing technology. Included in this panel are representatives from the ACLU, NAACP, Handgun Control International, the League of Women Voters, the National Rifle Association, police review boards, academicians, a police chief and other interested community groups.

And the Industry Panel is made up of CEOs and other senior managers of major established and newly created, entrepreneurial companies. Their purpose is to help us identify barriers to the entry and survival of companies in the law enforcement market and their interest has been intense. Our technology conference this year, for example, is sponsored by an industry association - the American Defense Preparedness Association (ADPA), which has also created a special law enforcement industry panel.

Although the NIJ program to leverage defense and other federal technologies is barely two years

old,²¹ it has already produced:

- Interest in the national laboratories, defense and intelligence agencies, and in defense industries in including law enforcement requirements in research and development efforts. Among these are: The Aerospace Corporation in El Segundo, California, which has created a self-funded Public Safety Division; Kodak, which is creating a forensic image analysis center of excellence in Indiana; Sandia and Idaho National Engineering Laboratories, which have both created strong partnerships with state and local law enforcement agencies in their states; Oak Ridge National Laboratories, which is now establishing the Center for Applied Science and Technology for Law Enforcement (CASTLE) and has already provided support essential to solving crimes in Tennessee; and many others. All of these, at our urging, are forging strong bonds with local agencies and providing kinds of support never before available to these agencies.
- A prototype rear seat airbag to safely restrain uncooperative prisoners in the back seats of police cars which we believe will be possible to manufacture and sell at a cost no greater than that of the best current restraint seat. Because we lacked funds to purchase a police car in which we could install and test this device, Sheriff Pat Sullivan of Arapaho County, Colorado, loaned us a car. That car was used in a demonstration and review for police personnel of the entire NIJ Less than Lethal program earlier this year at the Montgomery County Police Academy, and for subsequent safety testing.
- A prototype barrier strip which can deflate tires safely and which we anticipate will sell for about one quarter of the cost of current strips, while offering more capability and substantially greater safety than existing methods. Current strips have detachable hollow needles on a flexible strip. To deploy them, a police officer has to get in front of the suspect, wait until all innocent drivers

have passed and then - directly in front of the suspect - pull the strip across the road. If he isn't hit by a car as he does that, he then has to yank the strip off the road after the suspect passes and before any other car can run over it. The device we developed at Idaho National Engineering Laboratories is fairly simple. It will allow the needles to be deployed while retracted so cars can safely pass over the strip. A simple manual handle can then be used to raise the needles only for as long as is needed to safely deflate the tires of the suspect. The Huntington Beach, California Police Department can attest to the potential usefulness of this device. They had the front tires of two police cars destroyed last year because they couldn't get the old-style strips out of the way fast enough. Incidentally, currently available strips cost about \$800 per unit. We believe this more capable unit can be manufactured for about one third of that cost.

- ♦ A prototype velocity-adjusting weapon which will allow rubber bullets or other safe projectiles to be fired without causing injury at any distance.
- ♦ The development of teams at each of the five national laboratories involved in NIJ projects - Sandia, Idaho, Lawrence Livermore, Los Alamos, and Oak Ridge, made up of scientists, local police and corrections officials and social scientists working to develop practical and affordable less than lethal technologies.
- ♦ At the request of the law enforcement community and with the assistance of the Southern California Chapter of the American Civil Liberties Union, the first comprehensive studies of the safety and effectiveness of the pepper spray that is increasingly being used by law enforcement. As a byproduct of this effort, which was completed only recently, we have identified positional asphyxia as the cause of an estimated 80% of all in-custody deaths and - with the assistance of the International Association of Chiefs of Police - have provided Police and Sheriffs departments

with information on how to prevent positional asphyxia deaths.

In addition, the National Institute of Justice has initiated projects to:

- ♦ Develop a weapon that can be fired only by its owner to protect police officers and make handguns in the home safer. Since 1980, one in every seven police officers killed with a firearm has been killed with his own gun, while hundreds of children every year are killed with improperly secured handguns. This project is almost ready to be moved into the commercial market and both Colt and Smith and Wesson have been enthusiastic supporters.
- ♦ Develop disorienting or dazzling light systems with protective eyewear for police.
- ♦ Identify anesthetic compounds with very high safety margins and develop effective ways to simultaneously deliver both the compounds and the antidotes to dramatically increase safety.
- ♦ Develop synthetic compounds that can be used to identify fingerprints on particularly difficult surfaces.
- ♦ Improve the efficiency of DNA identification by developing massively parallel electrophoresis to provide tools to allow the rapid processing of large numbers of samples.
- ♦ Develop better technologies for the identification of trace evidence.
- ♦ Put key reference materials developed by the National Institute of Justice and essential to crime laboratories and investigative agencies on digital media, such as CD ROMs.
- ♦ Develop, publish and - in some cases - administer standards for key law enforcement equipment such as soft body armor, DNA identification technologies, handguns, handcuffs, police car packages and other equipment.
- ♦ Publish materials to provide law enforcement agencies information on new technologies.

Partnerships between the Department of Justice and the Department of Defense are not new. The Advanced Research Projects Agency (ARPA) and other Defense Department agencies have at least a decade-long history of sharing advanced technologies with federal law enforcement agencies. There are, in cooperation with the FBI alone, more than 30 projects currently underway. But that assistance has not, until very recently, extended in any systematic way to the state and local level.

In June, 1993, the Attorney General asked the Secretary of Defense to assist us in identifying and transferring military technologies useful to law enforcement. The Advanced Research Projects Agency responded in December by asking NIJ to develop a list of law enforcement priorities ARPA could consider integrating into its research and development plan. An ARPA project manager subsequently was invited by NIJ to meet with and brief the Law Enforcement Technology Advisory Council. That group identified three immediate priorities for development:

- ♦ A device capable of identifying handguns, which has much greater discriminating power than existing metal detectors. Probable cause rules require that we know with a high level of certainty that a subject is carrying a gun - not just a piece of metal that might be a gun. This device is needed in three configurations: one capable of being placed unobtrusively in school entrances; One capable of being mounted in and operated from a vehicle; and a handheld or portable version that can be placed in high-interest locations.
- ♦ The whole range of less than lethal technologies, but especially technologies capable of stopping cars safely; and
- ♦ A version of the personnel status monitor and remote surgical system being considered for development for use by military medical personnel. This device provides video and audio

transmission capabilities, life sign and location monitoring. Interest in this system is wide-ranging because it would greatly strengthen the ability of officers on foot to work in a genuine community policing role, permit supervisors to observe and assist as needed, and provide warning if an officer is in trouble (as well as information on where he or she is). The vital signs and locator monitors could also be used by themselves to provide far more robust and potentially less expensive electronic incarceration systems, and the vital signs monitor could help alert officers when a prisoner in custody is experiencing life-threatening physical problems.

In April, 1994, the Attorney General signed a Memorandum of Understanding which created a new Joint Program Steering Group to be manned jointly by Defense and Justice Department personnel. Stationed full time at ARPA, this group is now putting the final touches on a joint program plan which will commit \$37.5 million or more to the development of technologies which have applications of great value to both the military and law enforcement.

But while we share many needs, we have to remain conscious of the very real differences. As the attorney general told her military audience:

"Let me emphasize some differences that, coming from a defense background, you may not be used to, but which are critical to understanding how you can help law enforcement.

"Your standard for nonlethal technologies is generally one of minimizing collateral damage; our standard is the elimination of *any* collateral damage.

"When less than lethal technologies are used by law enforcement, remember that they're not being used against an enemy; they're being used to help protect fellow citizens. When police use these devices, they must be constrained by the knowledge that the people they are restraining aren't enemies; they are fellow citizens, with a full set of civil rights.

"In the military, the mission comes first, even if it means sometimes sacrificing the safety of bystanders. For the officer, it is the safety of those bystanders that is paramount."²²

But more than a Joint Program Steering Group is needed if we are to succeed in leapfrogging U.S. law enforcement from a dependence on weapons available in Wyatt Earp's time into the 21st Century. There are at least six major elements that should be undertaken to ensure that programs to transfer technology to law enforcement are more effective and more lasting than past efforts.

First, we will have to draw attention to the advantages technology can offer to law enforcement, because, while virtually no money has been invested in developing effective technologies specifically for law enforcement, it is also true that law enforcement has not readily embraced technology. Instead, budget increases have almost invariably been committed not to tools to make the department more efficient, but to additional manpower. The result is that 97% or more of the vast majority of law enforcement budgets are invested in manpower (80% or more in the largest agencies, and 100% in the smallest). While there is no substitute for an officer on the beat, public budgets are simply too tight to allow us the luxury of overlooking the efficiencies technology can provide.

For example, the 80% savings realized by the Drug Enforcement Administration's Automated Booking System translates into an hour saved for every booking operation. At that rate, every 1700 bookings would be roughly equal to one full man year of savings. In New York City alone, savings on that scale would mean - with nearly 250,000 arrests annually - a savings equivalent to putting an additional 147 officers on the street. Nationally, it could mean the equivalent of more than 8,500 officers.²³ And, fully implemented, the system could allow better records, better support to prosecutors, and fewer mistakes. More importantly, with a moderate level of national emphasis, it could provide for a standardized booking system which could - in turn - prevent an arresting jurisdiction from releasing a

suspect they were unaware was wanted by another agency in another state. Other technologies offer at least as much promise, if only we are willing to take advantage of them. We will realize those savings at the federal level because steps are being taken to expand the system to support the U.S. Marshals Service and the Border Patrol.

Yet, ironically, this new system typifies some of the largest shortcomings in the way we support state and local law enforcement. There have been several proposals before Congress which aim at improving the automation capabilities of state and local agencies. Unfortunately, none of these included provisions requiring that equipment funded by the federal government comply with standards designed to ensure compatibility of those systems with national systems currently being developed. Unless we establish requirements to ensure that compatibility we may - with the best of intentions - wind up repeating the mistakes of past years by providing equipment which may be made obsolete even as we fund its purchase, thus delaying further our ability to establish the sort of networks we will need to most efficiently catch criminals or perform background checks.

Second, we need to identify a principal focus for law enforcement technology efforts, to coordinate the development of new technologies, eliminate duplication and ensure law enforcement involvement so we avoid the costly mistakes made too often in other federal research and development efforts.

One of our major concerns is in husbanding our limited resources by ensuring we don't waste money in duplicative efforts. About a year ago, when we first started to inventory what was in the field and what was being developed, we stumbled across several cases where different agencies were working on the same problem, but didn't know about each other. Determined to fix that problem, the Attorney General directed NIJ to take steps to ensure that we were sharing information about what all the Justice

Department agencies were doing. That way, we could jointly identify the most promising projects and concentrate resources on them, rather than conducting lots of little efforts to solve the same problems. Doing this allows us to capitalize on successes already made. But we can do that only if we rely on intelligently structured partnerships which allow us to share information and pool resources.

While both the military and law enforcement need many of the same technologies, the differences in the structure of these two communities, coupled with tightly constrained budgets at the state and local levels have forced us to follow a somewhat different requirements and development process than the military is used to. We didn't even have a clear idea what technology was already in the field, so we had to start with a series of surveys. Then we relied on the various program activities previously mentioned, as well as seminars, conferences, and workshops to develop a list of what law enforcement thinks it needs, and began exposing the law enforcement community to some of the technologies available in the military and intelligence communities on the theory that no one ever had a requirement for a telephone until he knew what a telephone was. Finally, we reassessed what they needed and began crawling through the federal research and development agencies and meeting with industry. We will continue this process as we expand our understanding of law enforcement requirements and of the potential of technologies already developed.

Third, we need to create a mechanism to ease access to technological information by public safety agencies. One particularly efficient way to do this is through the technology centers recently established by NIJ. These centers are working to consolidate information and provide it to law enforcement. For most law enforcement agencies, it is very costly to devote an officer's precious time to finding technology-related information, and is even more difficult to locate specialized technologies to meet key needs. The technology centers will:

- ♦ Build on existing information networks and services by providing a gateway to law enforcement technical information so agencies can get answers with a single telephone call. The centers can answer many questions directly, but they can also maintain lists of key sources and points of contact that agencies could be referred to for further information. These capabilities can add to the usefulness of existing services, such as the Regional Information Sharing System (RISS) and the FBI's Engineering Research Laboratory in Quantico, and greatly increase access to technical information for smaller law enforcement agencies;
- ♦ Maintain consumer information for law enforcement equipment. Since testing of all law enforcement equipment by each local police department is far too expensive to be practical, the centers will maintain lists of equipment purchased by agencies throughout the United States. Agencies calling about specific products can then be referred to departments with actual experience with the product. There is no other comprehensive source of such information for law enforcement.
- ♦ Increase the usefulness of very high cost/low use equipment. Extraordinarily capable high technology equipment with potential applications in law enforcement exists in a number of places, but access to the equipment - or even knowledge of its existence - is rare. Where feasible, the centers can help coordinate the use of some of that equipment and greatly enhance its value to the taxpayer.
- ♦ Develop a mechanism for the gathering of information on what technologies law enforcement and corrections agencies actually need so they can be passed on to scientists and industry. Historically, the identification of law enforcement "needs" has been a task undertaken without law enforcement input. More often than not, one or more technologists - often with the sketchiest

understanding of law enforcement operations - have simply assembled lists of interesting technologies which have been too expensive, too complicated, and too unrelated to the realities of law enforcement, and especially to the liability problems posed by new technologies. Our efforts in this area have already begun to pay large dividends. In 1992 we received barely \$1.5 million in proposals to develop law enforcement technologies, but we received more than \$20 million in the first quarter of 1995 alone!

Fourth, we should continue to build on the DOJ/DOD Joint Program Steering Group to establish a way to ensure, wherever appropriate, that public safety needs are taken into account in the earliest stages of every federal research and development effort. For example:

- ♦ The U.S. Army is currently developing simulation technologies which will allow the creation of inexpensive platforms for training individuals. The Army National Guard, for example, has a critical requirement for simulators for training since they lack the training space and equipment available to active units. If new simulators are designed from the beginning to include public safety training requirements, then every National Guard armory with the equipment will also have available a trainer useful for local police, fire, and rescue departments, and - instead of being useful one weekend a month - the equipment can be useful nearly every day.
- ♦ The state of Iowa has in place a statewide fiber optic system which will provide a foundation for linking all the public safety agencies in the state and which, when joined with simulation capabilities like those mentioned above, can provide uniquely capable training systems suitable for training individuals, whole agencies, or the entire state apparatus in emergency operations.

And it's not just the Army that has capabilities that can be used to support law enforcement. Naval In-Service Engineering - East (NISE-E) in South Carolina has available to it a modern Navy brig which

will provide an ideal platform for testing technologies suitable for use in corrections facilities. We have already taken steps to involve every state corrections agency in the United States in our efforts at that site.

There is probably no single area where a partnership between defense and law enforcement can pay dividends as great as those that are possible through the joint development of simulation technologies.

Fifth, it is essential that we establish a process to ensure the safety of law enforcement technologies, both for the public and the officer. There is no current mechanism in the United States for the systematic monitoring of the safety of newly introduced law enforcement equipment. Pepper spray, for example, became the most widely used less than lethal technology in the United States over a period of barely three years. At the same time, it became so popular among private citizens seeking self-defense alternatives to handguns that we estimate 90% of all pepper spray sold in the United States is sold to private citizens. Yet all this happened without the benefit of a single, comprehensive safety study. It was only in June, 1993 that a series of scientific studies were undertaken by NIJ to determine whether pepper spray was as effective as claimed and as safe as a law enforcement technology should be. We initiated a major study with the Baltimore County Police Department and began an intensive effort to collect data on any fatalities which occurred during incidents in which pepper spray was used. We are continuing those efforts, but have already begun to provide law enforcement and the public essential safety information in the form of user guides and medical reports, and are using pepper spray as a model for the development of a mechanism for monitoring the safety of other technologies employed by law enforcement.

Finally, and most importantly, we must address the fragmented buying power of law enforcement. With the possible exception of communications equipment vendors, the fragmentation of

the market makes it difficult to interest companies large enough to bring the advantages of economies of scale to law enforcement markets. The result is that local agencies are sometimes the victims of less than competent and sometimes even unscrupulous producers and vendors. There is, for example, no manufacturer that builds a car designed specifically for police. We have specially designed postal and UPS trucks, but police departments lack the concentrated buying power to interest manufacturers in producing specially designed cars for police. In fact, police buying power is so limited that the police were unsuccessful even in persuading manufacturers to seek a waiver from the National Highway Traffic Safety Administration which would allow them to produce cars without the passenger side airbag for police. The right side airbag is forcing many agencies to completely re-engineer the placement of police equipment in their cars.²⁴ Critical to the success of these efforts, however, is the direct and detailed involvement of law enforcement at every level, from local to federal, to ensure that decisions are driven by real needs and that products are acceptable to the officers who have to use them.

No small part of this is making technology transfer really work. Unlike most research and development agencies in the United States, technology transfer is not an important, but secondary mission. It is, rather, central to our success. With more than 17,000 agencies around the country, each making its own buying decisions, we have to make it possible for industry to enter and succeed in the law enforcement market, or the successful modernization of our law enforcement agencies will remain only a remote dream.

We know technology can't fix every shortcoming. We know it can't make up for poor judgment or compensate for inadequate or nonexistent training. It can't fix the problems that result from poor officer screening or selection and it can never replace competent leadership. But it can provide tools to increase options, make the police officer's job easier, increase the effectiveness of law enforcement, enhance

productivity in law enforcement by reducing administrative overhead and improving responsiveness, limit the consequences of poor judgment and improve the safety of the police and the public. Technology *can* save lies.

Nothing can substitute for a cop on the beat, but we owe it to them to provide the tools they need to meet the complex challenges of daily policing in a safe and effective manner.

Mr. Chairman, I would be happy to respond to any questions the Subcommittee might have.

Notes

¹ 42 U.S.C. 3721, Section 201.

² The Honorable Jeremy Travis, Director of the National Institute of Justice, *Exploring the Federal Research Role in Crime Control Policy*, to the Fortunoff Criminal Justice Colloquium, New York University School of Law, January 23, 1995.

³ Dupont Kevlartm Survivor's club

⁴ John Granfield, Jami Onnen and Charles S. Petty, M.D., *Pepper Spray and In-Custody Deaths*, March 1994, published by the International Association of Chiefs of Police as part of the Science and Technology series of its *Executive Briefs*, under a grant from the National Institute of Justice.

⁵ *Violent Crime in America*, International Association of Chiefs of Police, April 27, 1993. The December 13, 1993 issue of *Business Week* estimates that crime poses at least \$270 billion in costs in the form of property losses, urban decay, medical expenses, and shattered lives.

⁶ *Justice Expenditure and Employment*, 1990, Bureau of Justice Statistics, U.S. Department of Justice. *Business Week* and others have estimated the costs, both direct and indirect, from 20% to 100% higher

⁷ *Private Security: Patterns and Trends*, National Institute of Justice, U.S. Department of Justice, August, 1991.

⁸ Geoffrey P. Alpert, *Police Pursuit and the Use of Excessive Force*, unpublished, and Chief Tim Grimmond, "Police Pursuits, *Police Chief*, July 1992, pp. 43-47. Various studies have produced fatality estimates ranging from a low of about .38% to a high of 3% of pursuits.

⁹ At the end of 1990, we were holding 883,593 Federal and state prisoners at an annual average cost of more than \$18,000 per inmate, exclusive of the cost of the prison itself. Not included are

another 444,584 in jails, many for terms greater than six months. *Prisoners in 1992*, Bureau of Justice Statistics, U.S. Department of Justice, May, 1993.

10. Uniform Crime Reports: Crime in the United States, 1970 through 1991, Federal Bureau of Investigation.

11. The sources for police workload levels and crime clearance rates are the Uniform Crime Reports published annually by the Federal Bureau of Investigation. Under the FBI's Uniform Crime Reports definition, a crime is generally considered cleared when someone is arrested, charged and turned over to the court for trial. Some researchers have suggested that police workloads have actually increased 500% or more. The large differences between reported crimes - those reported in the UCR - and the Victimization Survey conducted by the Bureau of Justice Statistics suggest that the higher estimates are certainly plausible.

12. Census Abstracts, 1992, U.S. Census Bureau.

13. Few law enforcement technology projects, except those support Federal law enforcement agencies, are funded at more than \$200,000 per year.

14. *Census of State and Local Law Enforcement Agencies*, 1992, Bureau of Justice Statistics, U.S. Department of Justice, July, 1993.

15. *Prisoners in 1992*, Bureau of Justice Statistics, U.S. Department of Justice, May, 1993.

16. Since 1980, about one in every seven officers killed with a firearm has been killed with his own weapon. This project will adapt existing technologies to develop a reliable weapon which can be fired only by authorized users.

17. The National Institute of Justice has initiated a project which will allow police to tag a fleeing car - while it is in motion - so that it can be tracked when a police pursuit is not feasible or too dangerous.

18. Four corrections officers were seriously injured - one nearly killed - in New Mexico in August, 1993, as they tried to remove an uncooperative prisoner from his cell. The injury rate among the officers who make up cell extraction teams is consistently very high.

19. Much law enforcement equipment is directly usable in several related areas (e.g., radio systems, 911 systems, etc.). The potential market therefore includes at least 840,000 employees of police agencies, 1.5 million private security employees, 400,000 corrections employees and 340,000 fire department employees. Data is taken from Bureau of Justice Statistics, National Institute of Justice and Bureau of the Census reports.

20. Even pepper spray is available to law enforcement at affordable prices in large measure because nearly 90% of the product is sold to private citizens for personal protection.

²¹In 1989, Congress directed NIJ to develop a prototype less than lethal device. In 1992, responding to major findings from these earlier efforts, NIJ established a more comprehensive, integrated program to develop and employ several devices to meet a variety of less than lethal requirements. Since the effort to develop this device inevitably resulted in the identification of other technologies of value to law enforcement, a parallel technology transfer program was also initiated to facilitate the transfer of more general technologies to law enforcement.

²²Reno, November 17, 1993.

²³These calculations are based on only the roughly 10,000 agencies included in the FBI's *Uniform Crime Report*. There are more than 17,000 agencies nationwide. A single system is capable of 35,040 bookings per year (at 15 minutes per booking), for a potential savings of 20 man years per booking station. Even if the system performed at only one tenth that level, each system would be worth nearly ten times its cost in manpower savings in the first year alone (based on a cost per system of about \$20,000). This system is now being tested and evaluated by NIJ at several locations in Florida. If those results validate its value, the system will be installed in all Justice Department law enforcement agencies which have a requirement to book prisoners.

²⁴Car manufacturers produce police car "packages", which are essentially assembly line cars with different paint (if the department can afford it), special lighting packages, beefed up transmissions, suspensions and engines (in some cases), and other accessories. The right side airbag makes mounting radar guns, radios, or other equipment on the passenger side of the dash dangerous to the officer driving, even when the right seat is seldom, if ever, used for passengers.

Mr. McCOLLUM. Thank you very much, Dr. Boyd, for that comprehensive analysis.

Chief McEwen, if you could give us your thoughts, and we'll ask both of you a few questions. Thank you.

STATEMENT OF HARLIN R. McEWEN, CHIEF, ITHACA POLICE DEPARTMENT, ITHACA, NY

Mr. McEWEN. Thank you, Mr. Chairman, members of the subcommittee and staff. I appreciate the opportunity to appear here today and to share my views with you on how law enforcement technology can make our country a safer place. First let me briefly explain my interest and involvement.

I have been a law enforcement officer for over 37 years, 19 years of which I have served as a chief of police. Since 1978, I have been a member of the National Institute of Justice Law Enforcement Technology Advisory Council, commonly referred to as LETAC. Since 1989, I have served as the chair of LETAC.

LETAC is comprised of over 80 State, local, and Federal law enforcement officials from the United States and Canada, and has been working over the years to promote improved and affordable technology for law enforcement use. As it relates to my appearance before you today, I also serve as the chair of the Communications Committee of the International Association of Chiefs of Police, the IACP, and I have served in that position for over 17 years.

My commitment to law enforcement technology over the years has been due to a desire to improve law enforcement methods in the United States. Because there are over 17,000 law enforcement agencies in this country, it is not possible or practicable for them to do the research and development necessary to provide them with modern technology. Law enforcement has had to rely primarily upon private industry to do their research and development. This is basically market driven, rather than driven by the actual needs of law enforcement.

For more than 20 years, the National Institute of Justice and the Law Enforcement Technology Advisory Council have been providing the only nationwide coordinated research and development program for law enforcement. Among the accomplishments of the program was the development of soft body armor for police officers. This program alone has saved the lives of well over 1,000 police officers.

Unfortunately, the NIJ budget has never been sufficient to adequately address the real technology needs of the country's law enforcement officers. Last July, I had the privilege of testifying before this committee to discuss less than lethal technologies for law enforcement and corrections. The fact that the committee has chosen to address the broader issues of law enforcement technology tells me that the Congress continues to take seriously the problem of crime in America. The need for good law enforcement services in this country should be and is a nonpartisan issue and the efforts of the Congress to enhance our ability to combat crime has received unprecedented bipartisan support.

Last year when I spoke to the committee, I expressed my encouragement by the signing of a memorandum of understanding between the Department of Defense and the Department of Justice

to work cooperatively to make possible the transfer of military technology to civilian law enforcement use. In my view, this is an unprecedented opportunity for improved law enforcement services in the country.

I want to again repeat what I said last year as it relates to the need for congressional funding. I related my experience in testifying before Congress on numerous occasions over the years and that on one of those occasions, I came with a large stack of reports of studies funded by Congress. I briefly described each of them. This study was done for \$760,000 and one of its recommendations was that the police should have improved police radios. This study was done for \$1.7 million and recommended that police should have improved radios. This study was done for \$1.2 million and recommended that police should have improved radios, and on and on and on.

Finally, I said to the congressional committee, you have spent over \$15 million on studies telling us that we need better police radios. We already knew that, and if you had given us the \$15 million to buy police radios, the problem would have been solved. I repeat that because it's an important issue and I hope that you get the message. The bottom line once again is, we need your help to pay for new and improved technology for law enforcement.

The Congress keeps recognizing the fact that crime in America is the No. 1 priority. Yet, we struggle with the fact that you also need to establish the problem of crime as the No. 1 congressional funding priority. It is a very important issue for us today. We hope you address that. The programs that David Boyd has described and that I will talk about, are grossly underfunded. Although there has been great progress in the last year, we still need much more support.

I want to acknowledge the efforts of Jeremy Travis, Director of the National Institute of Justice and the NIJ Director of Science and Technology, David Boyd. They have assisted us in generating the interest of many people in both the private sector and State, local, and Federal governments to make law enforcement technology improvements a priority issue.

This week, the National Institute of Justice, with the support of the American Defense Preparedness Association has been conducting the second major conference on law enforcement technology for the 21st century. The conference, being held at the Washington Hilton, has attracted many representatives of Federal, State, and local law enforcement, Federal and private labs, industry, defense, corrections, and Congress. The former Chair of this committee, Congressman Schumer, addressed the conference, as did Congresswoman Pat Schroeder. Unfortunately, the Chair, who was scheduled to come, had a conflict and couldn't be with us yesterday. But we would have certainly enjoyed your company as well.

At the first conference conducted last year, it was recommended that a national law enforcement technology center be established by the National Institute of Justice, and with your help, that is now a reality. That is an important step toward addressing the needs of improved technology for law enforcement. Even more importantly, with bipartisan support, as you mentioned, Mr. Chair, the House amended its version of the crime bill to provide for a 1-

percent set aside of crime bill appropriations for the development of law enforcement technology. We want you to know how appreciative we are of this action.

Today, the Oklahoma bombing is foremost in the minds of all Americans. We are extremely proud of the law enforcement response to this tragedy and in particular, the work of the Federal Bureau of Investigation and the other agencies assisting them. You should not overlook the fact that part of the solution started with a State trooper who was doing his everyday good work out on the highway.

FBI Director Louis J. Freeh appeared before this committee on April 27 to speak about the need for Congress to help law enforcement in its efforts to combat terrorism and violence in America. In his testimony, Director Freeh said:

Law enforcement must have the ability to communicate rapidly by radio and other forms of wireless communications. Local, State and Federal law enforcement officers and agencies must be able to talk among themselves, so that a State trooper on America's highways—like Oklahoma—has the full benefit of law enforcement's knowledge as he approaches a car with a suspect in it.

I fully agree, and I again emphasize the urgency of this matter.

In my role as Chair of the IACP Communications Committee, I have been working with the FBI, the Drug Enforcement Administration, and other Federal law enforcement agencies to identify strategies to improve law enforcement communications in this country. In January, I met with the Chair of the Federal Communications Commission, Reed Hundt, and FCC Commissioner Susan Ness to discuss law enforcement and public safety communications needs. Joining me at that meeting were Dan Rosenblatt, the executive director of the IACP, and Ronnie Rand, executive director of APCO.

Since that meeting, the House Appropriations Committee directed the FCC Chair to prepare a detailed plan as to how the FCC was going to address the communications needs of public safety in this country. I strongly believe that Congress should appropriate for law enforcement communications needs, some of the \$7 billion the FCC recently raised in the auctioning of radio spectrum for private radio services.

I have discussed the problem of law enforcement communications with FBI Director Freeh and DEA Administrator Thomas Constantine and I have been meeting and talking with FBI Assistant Director William E. Baugh and FBI Assistant Director Steve Pomerantz and members of their staff on a regular basis. Mr. Baugh is in charge of the Information Resources Division of the FBI and Mr. Pomerantz is in charge of the Criminal Justice Information Systems Division. We are all trying to meet the needs of combating crime in a modern society with mostly outdated communications equipment and inadequate radio spectrum.

I am also working with the Association of Public Safety Communications Officials International, commonly referred to as APCO, to address the technical wireless communication needs of law enforcement and public safety. We are all working together in an unprecedented coordinated effort to solve the Nation's law enforcement and public safety communications problems.

I doubt most of you realize that no Federal, State, or local law enforcement agency in this country can legally do what you saw on public television when the news media followed O.J. Simpson down the California freeway. None of us, including the FBI, have the authorization for broad enough radio spectrum to transmit live video like the news media has.

Let me just say that we need you to support the National Performance Review Initiative to implement a nationwide interoperable wireless network for Federal, State, and local law enforcement and public safety agencies. Funding will be required for the planning, design, development, and implementation of such a wireless network.

In closing, I would observe that although I have been here before and nothing much seemed to happen, I have confidence that with the unprecedented bipartisan support we are now receiving from Congress, law enforcement technology is finally beginning to move. I am also pleased that Chief of Police Fred Heineman, who is now Congressman Fred Heineman, is a member of your committee. I think he will bring to the Congress and to this committee an insight which will be very helpful to you as you consider these important issues. We are pleased that he is a member of this committee.

We will appreciate your efforts to make the research, development, and procurement of law enforcement technology a priority of this committee. We desperately need your help if we are to equip our law enforcement officers with the technology they need and deserve in combating the increasing violence in America.

I want to extend my thanks to Chairman McCollum and the members of this committee for inviting me to appear before you today. Thank you.

[The prepared statement of Mr. McEwen follows:]

PREPARED STATEMENT OF HARLIN R. McEWEN, CHIEF, ITHACA POLICE DEPARTMENT,
ITHACA, NY

Mr. Chairman, Members of the Sub Committee, and Staff:

I appreciate the opportunity to appear here today and share my views with you on how law enforcement technology can make our country a safer place.

First, let me briefly explain my interest and involvement. I have been a law enforcement officer for over 37 years, 19 years of which I have served as a Chief of Police. Since 1978 I have been a member of the National Institute of Justice "Law Enforcement Technology Advisory Council," commonly referred to as LETAC. Since 1989 I have served as the Chair of LETAC. LETAC is comprised of over 80 state, local and federal law enforcement officials from the United States and Canada and has been working over the years to promote improved and affordable technology for law enforcement use. And as it relates to my appearance before you today, I also serve as the Chair of the Communications Committee of the International Association of Chiefs of Police (IACP) and have served in this position for over 17 years."

My commitment to law enforcement technology over the years has been due to a desire to improve law enforcement methods in the United States. Because there are over 17,000 law enforcement agencies in this country, it is not possible or practicable for them to do the research and development necessary to provide them with modern technology. Law enforcement has had to rely primarily upon private industry to do their

R&D and this is basically market driven rather than driven by the actual needs of law enforcement.

For more than 20 years, the National Institute of Justice and the Law Enforcement Technology Advisory Council have been providing the only nationwide coordinated research and development program for law enforcement. Among the accomplishments of the program was the development of soft body armor for police officers and this program alone has saved the lives of well over one thousand police officers. Unfortunately the NIJ budget has never been sufficient to adequately address the real technology needs of the country's law enforcement officers. Last July, I had the privilege of testifying before this Committee to discuss less than lethal technologies for law enforcement and corrections. The fact that the Committee has chosen to address the broader issues of law enforcement technology tells me that the Congress continues to take seriously the problem of crime in America. The need for good law enforcement services in this country should be and is a non-partisan issue and the efforts of the Congress to enhance our ability to combat crime has received unprecedented bi-partisan support.

Last year when I spoke to the Committee I expressed my encouragement by the signing of a Memorandum of Understanding between the Department of Defense and the Department of Justice to work cooperatively to make possible the transfer of military technology to

civilian law enforcement use. In my view, this is an unprecedented opportunity for improved law enforcement services in the country.

I want to again repeat what I said last year as it relates to the need for Congressional funding. I related my experience in testifying before Congress on numerous occasions over the years and that on one of those occasions I came with a large stack of reports of studies funded by Congress. I briefly described each of them. This study was done for \$760,000 and one of its recommendations was that the police should have improved police radios. This study was done for 1.7 million dollars and recommended that police should have improved radios. This study was done for 1.2 million dollars and recommended that police should have improved radios, and on and on. Finally I said to the Congressional Committee, you have spent over 15 million dollars on studies telling us we need better police radios. We already knew that and if you had given us the 15 million dollars to buy police radios we would have solved the problem. The bottom line once again is we need your help to pay for new and improved technology for law enforcement.

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This week the National Institute of Justice, with the support of the American Defense Preparedness Association has been conducting the 2nd Major Conference on Law Enforcement Technology for the 21st Century. The Conference, being held at the Washington Hilton, has attracted many representatives of federal, state and local law enforcement, federal and private labs, industry, Defense, corrections and Congress. The Chair of this subcommittee, Congressman McCollum, and a former Chair, Congressman Schumer have both addressed the Conference. Many of the participants of the Conference are present for this hearing to exhibit their interest and concern on this important topic.

At the first Conference conducted last year, it was recommended that a National Law Enforcement Technology Center be established by the National Institute of Justice and with your help that is now a reality. This is an important step towards addressing the needs of improved technology for law enforcement. Even more importantly, with bi-partisan support the House amended its version of the Crime Bill to provide for a 1% set aside of crime bill appropriations for the development of law enforcement technology. We want you to know how appreciative we are for this action.

Today, the Oklahoma bombing is foremost in the minds of all Americans. We are extremely proud of the law enforcement response to this tragedy and in particular the work of the Federal Bureau of Investigation and other agencies assisting them. You should not overlook

the fact that part of the solution started with a State Trooper who was doing his everyday good work out on the highway. FBI Director Louis J. Freeh appeared before this Committee on April 27th to speak about the need for Congress to help law enforcement in its efforts to combat terrorism and violence in America. In his testimony, Director Freeh said "Law enforcement must have the ability to communicate rapidly by radio and other forms of wireless communications. Local, state and federal law enforcement officers and agencies must be able to talk among themselves, so that a state trooper on America's highways -- like Oklahoma -- has the full benefit of law enforcement's knowledge as he approaches a car with a suspect in it". I fully agree and again emphasize the urgency of this matter.

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in this country. I strongly believe that Congress should appropriate, for law enforcement communications needs, some of the seven billion dollars the FCC recently raised in the auctioning of radio spectrum for private radio services.

I have discussed the problem of law enforcement communications with FBI Director Freeh and DEA Administrator Thomas Constantine and have been meeting and talking with FBI Assistant Director William E. Baugh and FBI Assistant Director Steve Pomerantz and members of their staff on a regular basis. Mr. Baugh is in charge of the Information Resources Division of the FBI and Mr. Pomerantz is in charge of the Criminal Justice Information Systems Division. We are all trying to meet the needs of combating crime in a modern society with mostly outdated communications equipment and inadequate radio spectrum. I am also working with the Association of Public-Safety Communications Officials International, commonly referred to as APCO, to address the technical wireless communications needs of law enforcement and public safety. We are all working together in an unprecedented coordinated effort to solve the nation's law enforcement and public safety communications problems. I doubt most of you realize that no federal, state or local law enforcement agency in this country can legally do what you saw on public television when the news media followed O.J. Simpson down the California freeway. None of us, including the FBI have the authorization

for broad enough radio spectrum to transmit live video like the news media has.

In closing I would observe that although I have been here before and nothing much seemed to happen, I have confidence that with the unprecedented bi-partisan support we are now receiving from Congress, law enforcement technology is finally beginning to move.

We will appreciate your efforts to make the research, development and procurement of law enforcement technology a priority of this committee. We desperately need your help if we are to equip our law enforcement officers with the technology they need and deserve in combating the increasing violence in America.

I want to extend my thanks to Chairman McCollum and the members of this Committee for inviting me to appear before you today.

Mr. MCCOLLUM. Thank you very much, Chief.

Let me ask you a question about something you just said. You said that you don't have the ability to have a spectrum like you would like to have on radio for the purposes of things such as the O.J. Simpson chase. Could you elaborate on that? I know TV covered it. Everybody saw O.J. running up the road, et cetera, et cetera. But I am not too sure if, from a law enforcement perspective, the things that were missing in that case would have been helpful to law enforcement or just what your illustration was supposed to point out to us. I'm not sure I understood your point.

Mr. MCEWEN. Well, the point I am making is that if we wanted to conduct a live video surveillance, we cannot do it. I am not relating the Simpson incident as something that we necessarily had to do on that occasion. But if we had wanted to do something like that, for instance, we'll say that some kind of a crime is in progress or some kind of a major disaster and we needed to be able to broadcast live video to a command post so that certain people could make decisions, have some sense of what's going on at the scene and so on. We do not have that ability to do that. The reason is, that it takes broad radio spectrum in order to broadcast live video. We just don't have the legal authority nor the spectrum to do that at this point in time.

Mr. MCCOLLUM. In other words, the FCC has not designated use in space to do it. If they designate you the space, you have the technology to do that. Right?

Mr. MCEWEN. Right. If you understand, you know, the FCC deals with our spectrum. The NTIA deals with the Federal spectrum.

Mr. MCCOLLUM. All right. I follow you. Also, when you talk about communications needs, a lot of what you are talking about, as you indicated I think, are the research and development part that NIJ and you all are about, not just our providing money for you to have equipment, but actually to have the advanced technology that we are going to need, I assume, to keep up with the digital telephone and wiretapping and all that kind of stuff. Right?

Mr. MCEWEN. It's exactly right. We need the foundation and we need the standards, and we need the development of that type of infrastructure. Then, most importantly, we need your help in funding some of that because we can not afford it.

Mr. MCCOLLUM. Dr. Boyd, Director Boyd, I should say, is there a program that you work regularly with the Federal law enforcement agencies that is different from that which you do with States? Is there a segregation of this or is the research just all generic to whatever is at the forefront and leading edge of law enforcement needs?

Mr. BOYD. Our focus is, quite bluntly, on State and local law enforcement. In fact, while we also fund some work with the FBI and others, we have insisted, or at least I have in the 2½ years I have been here, that we do that only when there's a legitimate payoff for that Federal investment in a broader context for all of law enforcement.

So for example, if we want to make improvements in DNA identification technologies, the logical place to do that is in the premier crime laboratory in the United States, the FBI laboratory. On the other hand, if we want to do some work on advanced communica-

tions systems that have application for law enforcement, the logical place for us to test those and make sure they meet requirements is at the State and local level.

If we don't do that, one of the hazards we face is that we may wind up developing a system that meets Federal requirements, which frankly are a bit different than State and local law enforcement requirements, and wind up creating a national infrastructure that causes State and local to have to replace their equipment in order to take advantage of that infrastructure. That frankly is a very backward and very expensive way to do things.

It makes more sense for us to start with the 95 percent of law enforcement at the State and local level and then try to make sure that anything we do at the national level is going to fit the kinds of things they have already invested in.

Mr. McCOLLUM. One of the points I wanted to make in this is the FBI does have its own lab. There are Federal research projects going on in addition to what you do. Is that not true?

Mr. BOYD. That is true. There is a different focus, however. FBI research projects are usually applications oriented projects to meet FBI operational requirements and tasks. They have a lot to do, for example, in advanced surveillance and in fact, they have loaned a lot of that to State and local. So that's an important issue.

What the FBI does not concern itself with as a rule, are those things which relate uniquely to State and local law enforcement.

Mr. McCOLLUM. But you do coordinate with them?

Mr. BOYD. Absolutely. In fact, the Deputy Attorney General has recently produced a memo where she is suggesting putting together a committee so that we can coordinate more effectively what is being done among Federal agencies with what is being done at State and local.

Mr. McCOLLUM. Now you say you test, monitor and certify the performance of things like the vest that you mentioned to us. Do you do that in-house? Do you contract some of this out? How is that done?

Mr. BOYD. We contract almost all of it out. In fact, soft body armor is a very good example, but we test only a limited number of other products, because it's a fairly expensive drill. With soft body armor, for example, we supervise the testing. The vests come in to us, we process them, and inspect them, record that information.

We then turn the vests over to two laboratories that are now certified to do the testing. One is H.P. White in Maryland. The other is Underwriters Laboratories in Illinois. The contractor who is actually building the equipment then pays the laboratory for the testing. All we do is ensure the integrity of the testing. It is a voluntary testing standard process. We find it works extraordinarily well without our having to create a large regulatory apparatus.

Mr. McCOLLUM. All right. Well thank you very much. I could pursue more questions and may come around to a second round, but I am going to yield at this point to Mr. Scott for 5 minutes of questions. Mr. Scott.

Mr. SCOTT. Thank you, Mr. Chairman. Director Boyd, you mentioned the radio spectrums, that you need a broad band of spec-

trum. Are those spectrums still available or have they been given out for some other use?

Mr. BOYD. I'm not certain, but I know that there is piece of spectrum. I don't know what its current status is. Harlin may know better. But I do know there's a piece of spectrum which was originally allocated for NATO use, which NATO in fact has released in Europe. In Europe, it's been turned over to public safety applications. To my understanding, and I'll let Harlin expand on that, it has not been released in the United States.

Mr. McEWEN. Yes. We're working cooperatively with the FCC and NTIA and the FBI and others to try to address the spectrum need. Some of the spectrum over on the Federal side that has traditionally not been available to State and local government is the spectrum that David is referring to.

There's about 20 megahertz of spectrum that was previously reserved for use of NATO, which has now been released in Europe. It is primarily being used by the European countries for public safety use. At this point, it's still in the domain of the Department of Defense. One of the things we're trying to do is to encourage that spectrum to be released, at least part of it and hopefully all of it, for the use of the public safety needs in this country.

Mr. BOYD. If I could explain why that is so important. If you go back to the 1920's when spectrum was first assigned to law enforcement, it was a matter of what kind of equipment a local department bought. That determined what piece of spectrum they were assigned. The result is that we have a patchwork distribution of frequency allocations across the United States.

I would be willing to suggest that in a given county that has say 20 suburban areas, that probably not more than three or four of them are able to communicate with each other.

Mr. SCOTT. I guess what I'm looking for is who do we need to talk to to get the spectrum released? Does the Department of Defense have that unilateral capability?

Mr. McEWEN. Well, the Congress certainly has the power to direct most anything, and to be very honest—

Mr. SCOTT. But I mean, that would be the Department of Defense. If we can coordinate with them, that's all we need to coordinate with?

Mr. BOYD. Well, there are two pieces. The NATO spectrum is controlled by the Department of Defense currently. It falls in their arena. However, if you move it out into public safety, it then becomes the property of the Federal Communications Commission.

Mr. SCOTT. OK. You mentioned technology for alternative incarceration. Someone mentioned that. Can you elaborate on what kind of technology we're talking about?

Mr. BOYD. Well actually, we're looking at several. One of the things we're developing now with the Westinghouse Corp. in Pennsylvania, in fact, is a terrestrially based system that will use a bracelet kind of approach so that we can track on a real time basis where a probation or parolee is going.

Right now, as you know, we're tied to a telephone. All we really know is that the parolee is within range of the telephone or at least that the bracelet is within range of the telephone. When he gets ready to leave for work, he calls and says, I'm leaving. He then

leaves for work. Until he arrives at work, we have no idea where he is or where he has gone, so the intervening period is a blank.

The system that Westinghouse is now working on with us will track a probationer or parolee continuously from the time he leaves his house and, provide information to a computer system all the way to his destination.

Now that doesn't have to be monitored by somebody. The computer can tell when he's gone out of bounds. More importantly, the computer can tell when he has now encountered another bracelet-wearing person that he is not supposed to be near, and can sound appropriate alarms. And of course you now have a record of where he has been during the time he has been moving.

Mr. SCOTT. Is this like what they are doing to recover stolen cars?

Mr. BOYD. Not exactly. Most of the stolen car recovery systems, such as Lojack, are really radio direction finder systems that you use to identify direction, and then use that information eventually to close in on the car. This system would actually provide very specific, precise location information so that you could actually tell exactly on what block on what street he was.

Mr. SCOTT. Are these things very expensive?

Mr. BOYD. Well, one of the things we have to be able to do is to persuade industry that there's a large enough market, and then create a mechanism for a number of agencies around the country to come together to make the buys so that we can make them affordable.

If we wind up building a few dozen of them, they will be extraordinarily expensive. If we can make them work and produce a market that's really worthwhile and large enough, then they should be fairly affordable.

Mr. SCOTT. The AFIS system for fingerprints.

Mr. BOYD. The which system? I'm sorry.

Mr. SCOTT. AFIS, A-F-I-S.

Mr. BOYD. Well, the technologies for AFIS of course are available. As you know, one of the difficulties with AFIS systems is that the FBI has been trying to create a national system. At the risk of talking a little out of school, one of the problems that they have had, is that because of limited funding, they have been able to build this national system fairly slowly. That meant that some States, in order to be able to control what is in their State, have begun to build their own systems. That over time has created some problems with compatibility, with the ability of the systems to work together.

Mr. SCOTT. How many States are on line right now?

Mr. BOYD. I can't answer that. I don't know.

Mr. MCEWEN. I don't know, but that's one of the major disasters in the Federal Government not getting a bigger role in coordinating into a standard. In other words, many States are going different directions. Many cities and counties are going different directions. There needs to be leadership, and that goes back to the communications thing.

If you help to give that leadership in developing a standard way of dealing with things so that there is compatibility all over this

country, that's our biggest problem. AFIS is a good example of non-compatibility in many places.

Mr. SCOTT. It has worked very well within Virginia.

Mr. MCEWEN. Virginia does very well. They have got a good system within their State. But the problem is, again, if you try to mesh that with other States or other cities, it does not always work.

Mr. BOYD. Col. Carl Baker just told me that there are no States on line right now, but that there are 29 States on line with the Interstate Identification Index.

Mr. MCCOLLUM. Thank you, Mr. Scott. Mr. Schiff.

Mr. SCHIFF. Thank you very much, Mr. Chairman. Mr. Boyd, it's my understanding that the budget for your particular office has gone up in the last 1 or 2 fiscal years. Is that correct?

Mr. BOYD. In this last year, it went from \$4.3 to \$9.3 million.

Mr. SCHIFF. So basically more than doubled in 1 fiscal year.

Mr. BOYD. That's correct.

Mr. SCHIFF. Though I understand it is not a huge budget.

Mr. BOYD. That's correct.

Mr. SCHIFF. Compared to other Federal agencies. I want to say, however, it is a remarkable recognition in this time of tight budgets, recognized by all government officials of all parties, for that increase to have been accorded to your agency. I want to ask, with the additional funding, in what direction do you intend to prioritize with it?

Mr. BOYD. I think probably the most immediate thing we'd need to do is to be able to provide a mechanism to get immediate information to law enforcement about what's actually available. That is probably the first priority. While not the most expensive, certainly the single most important priority is to work directly with law enforcement agencies in their own areas.

I think the second thing we need to do involves a broader effort. We are not going to be able to afford, at the Federal level, to buy all of the equipment that law enforcement needs. What we are going to have to figure out how to do—and I wish I could tell you I had all the answers but I don't—is to encourage industry to begin to build these things and sell them at affordable prices to the 17,000 law enforcement agencies that operate in the general market.

One of the ways we can do that is by working very carefully with the kinds of Federal research and development investments that have already been made, the kinds of things we're doing at Sandia or in Idaho, where we're able to cover the research and development overhead to develop the new product, because industry can make a profit selling a product once those R&D overhead costs that are such high risk for industry have been taken care of.

It is going to be tough to get industry to sell products that are going to be sold in terms of a few hundred or a few thousand, if they have to make substantial research and development investments for which there's no comfortable assurance they are going to get back adequate returns, and which will result ultimately in costs that are very, very high. We have got to take advantage of the research and development base that already exists in the country to help do that.

Mr. SCHIFF. It is my understanding that you have now established several technology centers. I'm not quite sure how many, but more than one.

Mr. BOYD. Right.

Mr. SCHIFF. Would you say how many there are and why, if the whole idea is the Federal Government should concentrate, should be the point of focus for technology evaluation for law enforcement, why you would have more than one center.

Mr. BOYD. OK. First off, these are not research and development centers. The best way to describe what this is, is very much as a virtual center, to use a current computer term. The idea is that if we will create very small cells that are located regionally around the United States to work directly with law enforcement in that area, that is the test location. That is where we would demonstrate new technologies. That is where we would test the new technology. That is where we would go to the users to find out what it is they really need.

Then as we develop the technologies, the rational way for us to proceed is to go out to existing facilities. We don't want to build new laboratories. For example, we might go to Sandia National Laboratory and have some things developed that we need for law enforcement. Then we might take them and inform partnerships with industry to get them manufactured. So the best way to think of the centers is to see them literally as leveraging agents to help bring these parties together. The centers are not equipped to be laboratories, and I frankly don't think it would be wise to invest the money it would take to turn them into development centers themselves.

Mr. SCHIFF. They are primarily points of contact?

Mr. BOYD. Exactly. To provide a place that belongs to the police in that region, where they can call and say, I need a whatever, or I need an expert to do this, or I need to know where to go to find this information or get this thing.

Mr. SCHIFF. Two more things. One, Director Boyd, for you. We are all interested in the Congress on trying to prevent the illegal purchase of firearms from reputable dealers as just one way to regulate firearms from going into possession of people who are not legally entitled to own them. As you know, the Congress passed the Brady Act a short time ago. I personally have some question about whether a police manual check, the number of hours that takes, is actually a plus in the long run in terms of the number of criminals that are actually stopped by it.

The Brady Act itself recognizes that, at least to the extent that it proposes an instant background check eventually. The best instant background check would be with a biological identifying device, sort of an instant fingerprint identifier, so you know right there instantaneously if someone is a convicted felon.

Is NIJ working in that area, working with companies in that area? Could you tell me the status of it?

Mr. BOYD. Well, there are two pieces to that. In terms of identification of individuals, we are in fact looking largely at industry and the laboratories to help us solve that. But there's kind of an interesting twist in how we're working with it right now. Some of them are sitting on the table over here.

We have a major, what we call the smart gun project, which is an effort to try to develop technology that we can put into a gun so that the gun essentially recognizes its owner and will work only for a person who is authorized to use that gun. So even if you lose control of the gun, it is going to be hard to use.

That effort is just about ready to produce some genuine commercial products. In fact, you'll see just a limited number of the prototypes here. This project is also being done at Sandia National Laboratories, and we have been working on it for almost 2 years now. We have arrived at a point that we have prototypes that can be used only by authorized persons. We have Colt, Smith & Wesson, and others who are intensely interested in getting this transferred into the commercial market. We think probably its first payoff will be for folks who have weapons at home, making the weapon unfireable by little Johnny if he accidentally gets hold of it, so he can't shoot himself or somebody else.

Mr. SCHIFF. The last question I want to ask is, I believe that, Chief McEwen, you mentioned an existing memorandum of understanding between the Department of Justice and the Department of Defense to share research. Is there any memorandum of understanding with the Department of Energy, because they of course operate the National Laboratories that Director Boyd referred to. I'd be grateful for a very brief answer, because you can see my time just expired.

Mr. BOYD. There's no formal memorandum of understanding to do that on an overarching basis. There are several individual ones that allow us to go to the individual laboratories. We would be very interested in creating such a mechanism with the national laboratories, because those are facilities that we couldn't possibly afford to reproduce. We'd love to be able to have access to them.

Mr. SCHIFF. I just want to say I'd love to work with you on that. Thank you, Mr. Chairman.

Mr. MCCOLLUM. Thank you, Mr. Schiff. Ms. Lofgren.

Ms. LOFGREN. I don't have a lot of questions at this point. I was at another meeting and regret I just had a chance to read the testimony.

I guess one of the quick questions I have, and I'm familiar with some of the new tools that are available to us, and especially that are in use in my own district with the automated fingerprint system and MORC system that the San Jose Police Department uses has to do with the issue of money that you were addressing. I mean, there's great stuff out there, but if no one can afford to buy it, it doesn't do any good in terms of apprehending wrongdoers. Also, it deters technology driven companies from developing new things, if there's no market.

I am wondering, perhaps you have already said this, what your estimate would be that it would cost to provide sufficient funding to get this whole area moving to get products out into the field and to provide an adequate incentive to high tech companies to continue to produce. Do you have a dollar figure that you could estimate to us?

Mr. BOYD. I don't know that we have a specific dollar figure. What we have tended to do, at our level, is to ask what is it we

need to accomplish, and how much money have we got to start things to get people's attention and do it.

Let me give an example of how we introduced one technology. When we developed soft body armor several years ago, law enforcement frankly was pretty skeptical about it. They did not want it. It was bulky. It was heavy. It was uncomfortable. It was impractical. It would limit movement. Besides, they argued, if you put it on, they would shoot you in the head or the legs instead. So there was an intense amount of resistance in the field.

Our approach was to manufacture the first 5,000 sets, put them in the field, demonstrate them, and cause them to be used. That is probably the most rational way to approach it. That produced a major industry in the United States.

One of the things we did in the conference we ran for the last couple of days was to look first at industry's role and what it is going to take to bring industry in. I have had a broad variety of industries come to me. They tend, and I'll be frank, to come to me initially from a defense orientation. They tend to be really confused and frustrated about this market, because they think it ought to resemble the Defense Department and that I should come in and buy all of these systems to put out in law enforcement agencies.

I have to explain to them that they have got to think about this as a new kind of market. We'll help them work out the issues, but they need to think a lot in industry about how to reduce the cost of their products. I tell them, for example, that police departments generally get sticker shock at about \$1,000. You can sell more expensive equipment, but you had better have a darned good argument for it.

We also did something really unusual yesterday. Yesterday afternoon, we had a panel on innovative ways to fund technology. We were not talking about innovative ways to finagle you folks into providing more money or getting more money out of the State legislature or the other government coffers, but ways to find funding and support for law enforcement technology that even go beyond taxpayers. So we had presented some interesting, and some controversial proposals for ways to do that, ranging from getting surplus property to the rest.

One department, for example, wanted to refurbish nine cars. They wanted to put new communications equipment in them and really modernize those cars. So they had companies in their town donate \$1,500 a car. Then they put a sticker on those cars which said, "This car was refurbished by the donor company." The program turned out to be so popular that they did all 29 cars.

Ms. LOFGREN. One of the questions I have, and I don't have a proposal today, Mr. Chairman, but when I was in local government last year, we issued some bonds for technology, with the intent to pay off the bonds with the savings that the technology would allow. Rather than just guessing at it, we had it fully analyzed by an outside audit firm to confirm that it was really a sinking fund with the savings.

I think local governments, in particular, are under the gun financially. They are in many cases in no position to issue a bond, even though they know over a 4- or 5-year period, they would more than make up what their investment would be through savings. I think

one thing we ought to look at would be to provide some up front funding by way of a revolving fund, so that local governments could go into technology that would save them funds and set aside a sinking fund to repay the loan. I think that might be part of a solution, not all of the solution. Thank you.

Mr. McCOLLUM. Thank you very much, Ms. Lofgren. A very good point that you have made. Mr. Heineman.

Mr. HEINEMAN. Thank you, Mr. Chairman. I'd like to welcome Director Boyd and Chief McEwen. I always feel very comfortable when there are policemen around.

I'd like to say to you, Mr. Boyd, that I have always been and am at the present time, very supportive of NIJ. I have used NIJ over the years as far as information is concerned on product. As Chief McEwen knows and Chief Cansler knows, you have police officers always with a pet project and always with a pet piece of equipment that they would like to carry, that they would like the department to adopt. My standard has always been check with NIJ, see what they have to say, whether it is bulletproof vests, whether it is a type of weapon to carry, or what not. I have always found you folks to be very credible. I have found you to be a great relief for me as a chief, not having to go through private vendors and finding out which is the best.

I think as you look at this panel up here, and adding Pat Schroeder and Mr. Schumer to this Crime Committee and this Judiciary Committee, you will see a lot of law enforcement support. I have gotten to know my colleagues on this side of the chairman and on the other side of the chairman. I think we speak in one voice as it relates to support for you folks.

But you talked about productivity as it relates to technology. I agree with that. We have come a long way. But I think you need to go a little deeper into explaining some of the things as it relates to issues that we can now get into in law enforcement, with the capabilities we have to do things we never could do before. Things that never were done before because it would take 20 years of man hours to find the search fingerprint file to find a fingerprint, if it's there at all. To use the AFIS system. Of course we're looking to nationalize it hopefully, and find someone we never would have found before. With the DNA today, instead of executing someone for a crime he's been convicted of and being able now to run a DNA test to find whether that person is or is not the perpetrator of that crime. I think there have been incidents where people have been cleared through DNA of crimes they have been convicted of—and capital crimes at that.

We can't measure that in dollars and cents. We have to make our case for that so that when you approach a Crime Committee or a base for government funding of what you do, you can get into the human aspects of those things, which are more important than productivity.

But as I see, and certainly my history, Chief McEwen, has been as a chief, not as long as you have, but long enough to know the nightmares of a high speed chase and the death. Certainly, a policeman's death we feel, but all too often we find a high speed chase, and of course we know we have to make judgments on them. The judgments we make that are good judgments, nobody knows

about. But certainly, when there is a death, we get that usual death editorial on a high speed chase. It appears in the papers for 3 or 4 days. That is on top of all of the grief of the issue itself.

But is there a way, are we doing anything about attempting to disable vehicles that we are chasing? I know it's tough to disable an engine from the back, but I'd like to see that nightmare dispelled for a lot of reasons, the greatest of which is it prevents deaths.

Mr. BOYD. We have several projects in that area. Most of the projects right now have to do with improved ways to stop a car when you can get in front of it, which of course is only a subset of the high speed chase issue problem.

We, for example, have recently developed a barrier strip that is much improved over the current model. With current systems you have to get a volunteer officer whose mission is to try to find a break in the traffic, run out behind the good guys, get across the street in front of the bad guy without getting hit, nail the bad guy with hollow needles that deflate his tires so he doesn't lose control, and then get the device off the street before the police car hits it and he loses some tires.

We had the Idaho National Engineering Laboratory develop for us a device that allows the operator to remotely cause the needles to go up or down. So you could leave them down. You can put them out when it's safe to do that. Get that car. Put them down before the police car comes over.

We are currently looking at a device, and in fact, one of the witnesses here, Eric Wenaas and JAYCOR, is working on a project that we're intensely interested in trying to test as a possible application to stop port runners at the border. It's an electronic device. When you go across it, it blows out the distributor module, so the car behaves like it ran out of gas. It doesn't go anywhere until you replace that \$35 module.

We also are working on a project right now that's designed to try to apply a tag to a moving car from behind it, so we can fall off and track it by other means.

I have to tell you that we've done some careful looking at how you can stop a car in motion from behind it. That is a very difficult task. We looked at microwave applications. They in fact work. You can stop a car that way. Unfortunately, you also stop all the planes in a couple hundred mile radius. So we have some problems with that technology.

We have looked at a variety of such technologies. That is in fact, if you look at our program plan, one of our highest most intense priorities. That is one of the things that we have even talked the Defense Department into including as one of their priorities, so we can find some way to stop a car from behind, without causing injury to the occupants of the car, any innocent bystanders, or the police who are following it.

If we could do that, we can solve the single highest cost tort problem for law enforcement in the United States.

Mr. McEWEN. Let me just say, Congressman, that that probably is one of the most important issues to those of us that are law enforcement practitioners. On the advisory council, we have identified that. I'm sure you know Phil Lyon, the deputy attorney general

down in your State. He wrote to me about that very topic. I used that letter to promote our interest in that.

Mr. HEINEMAN. I see my time has expired. I'd like to get another shot at this later, Mr. Chairman.

Mr. MCCOLLUM. Thank you very much, Mr. Heineman. Ms. Jackson Lee.

Ms. JACKSON LEE. Without a bit of humor, I know my colleague was not suggesting he wanted to get another shot at these fine gentlemen. But I know the chairman will allow him to proceed with some additional very insightful questions.

Let me apologize to the witnesses for prior congressional business did not allow me to hear the oral presentation of your testimony. But I have had a chance to review the materials. I thank the chairman for this opportunity.

Might I add before I question you, to say that I personally find disturbing America's fascination with guns, particularly as it impacts our law enforcement officers. Chief, I particularly note those who are in the local communities, because they are certainly on the first battleline, if I might use that terminology, and of course just plain ordinary citizens.

Having come from local government, particularly our young people, who if you query them today in secondary and primary schools, they will tell you that what they want most is violence free schools. I think that is a new day, in terms of what children talk about in the school setting.

Mr. Boyd, if I might ask you about the NIJ, and I had knowledge of the fact that I believe you are in conference and have a series of individuals up for a series of meetings. I have met some of them who are here for your meetings.

Do you keep any statistics on how many States have implemented the concealed weapons bill or legislation? But more particularly to your presentation, can you give us some detail about your concealed weapons detection initiative and how much progress we have made in developing such devices to detect concealed weapons. I can imagine the plane stopping, the traffic stopping situation.

I would also like you to give some sense, if you have studied the budget, as to what respective budget might have, a block granting or the reduced budget for the Department of Justice might have on your work.

Mr. BOYD. We don't keep track in my Office of Legislative Issues like that or laws. But I am certain I can find the right folks who can find that answer for you and give it to you.

Ms. JACKSON LEE. I'd appreciate it. Thank you.

Mr. BOYD. As you probably know, on March 9, 1995, we announced several concealed weapons detection technology projects. In fact, we had a competition among a wide variety of proposals. We brought in folks from the scientific arena, including the military, to help us select the best of those projects. The chief scientist to the FBI, Joe Kielman, participated. The U.S. Marshals Service was involved. Carl Baker, who is sitting behind me from the State of Virginia also participated, and helped to pick out the three best of those technologies.

There is an interesting story behind this initiative. The President expressed an interest in pursuing this after he read an article by

James Q. Wilson, who mentioned that such a device could be helpful. He circled that paragraph and sent it to the Attorney General, asking if we could do anything. Of course it wound up on my desk.

We have now initiated three projects at NIJ. One of those is a millimeter wave technology, which takes advantage of the fact that your body right now is transmitting a kind of radio wave that can be detected. In fact, we can then produce an image using those radio waves.

If there is an object between your body and that detector, say a gun that's on your body, it will block some portion of the radio waves, so we can detect an outline. With some fairly sophisticated analysis, we can identify whether the outline is a gun or some other form of contraband. That is one of the technologies underway, and there have already been large scale prototypes demonstrated. The major technical challenge in this is to make it portable enough for law enforcement to carry.

The second one takes advantage of what happens when a magnetic pulse strikes something that is metallic. It winds up, in effect, retransmitting that pulse, but it modifies the wave form in a way determined by what the target is made out of and how it's shaped. With some computer analysis, we think we can refine that almost to the point of identifying the model of weapon it detects. We also think we can make it fairly compact, and make it particularly useful in places like schools. It uses a magnetic pulse which is weaker than the field which is produced by the metal detectors used in airports.

The third technology is a dramatic advancement on those portal technologies used in airports. It basically detects changes in the Earth's magnetic field when there's a gun or some other metallic material present. It not only can resolve with a very high level of reliability that there is in fact a gun, but we think it can even tell where on the body that gun is located.

At the same time, the Department of Defense is also interested in this subject and is initiating at least one additional technology. It may be infrared, or some other technology. They have asked us to manage our projects plus the defense projects together so we can keep them fully coordinated.

Our goal is to have testable, demonstrable prototypes in about 18 months, so that we can actually show that these things work. We have already been using a liability panel we created to look at constitutional and liability concerns so that we don't inadvertently produce a bigger problem than the one we are trying to solve. We have great hopes that at least this first phase will be completed in about 18 months. Our \$2 million has been leveraged by Defense, so there's actually about \$4 million in this project.

Ms. JACKSON LEE. Let me go to the chief. If you would give me in writing a response on how the proposed budget structure and block granting would affect and impact your being able to do additional work.

Then lastly to you, Director Boyd, if you'd give me a response to whether or not simultaneously to developing these technologies, are you working jointly with in essence, the lawyers of the Department of Justice as to the whole issue of probable cause and the ability to protect those that may be using it, as well as those who it will

be used on, so that the technology kind of tracks what the caseload will say.

Chief McEwen, if you would just simply, Mr. Chairman, if you would allow me to have him just answer whether or not these technologies have been effective for local law enforcement and whether he wants us to pursue this.

Mr. MCCOLLUM. Certainly. You may answer.

Ms. JACKSON LEE. Thank you, Mr. Chairman.

Mr. MCEWEN. Our committee is very much in favor of the research that's going on. None of them have yet been actually developed for use in the field. So the issues are simply that we want such technology. We will use it. We need it. It has to be affordable and it has to be safe. It has got to be something that we can use and not get sued.

Ms. JACKSON LEE. Thank you.

Mr. MCCOLLUM. Thank you very much, Ms. Jackson Lee. Mr. Chabot.

Mr. CHABOT. Thank you. I first want to apologize. We had a markup going on in the Subcommittee on Africa. That's one reason I wasn't here to hear your testimony.

I just had a quick question. There were a couple of different things that came up. I was on the city council in Cincinnati for 5 years and a county commissioner of Hamilton County, and remember some of the things that we came up with. I am just wondering what the level of technology, perhaps it has improved. One area is in the area of tasers, you know, shooting a dart and high voltage to basically incapacitate a person.

I remember several cases we had where the officers used the tasers that were supposed to incapacitate people. In one case I remember we had a somewhat deranged individual who on top of that was on drugs and was shot numerous times with tasers, which ultimately didn't work and they ended up shooting this guy, something like 17 times. He kept lunging at the police officers with a knife and he was killed. Of course as things turn around, his family then ended up suing the city for killing this guy. But nonetheless, I am just wondering, has there been any improvements in taser technology or what is the current status in law enforcement in that area?

Mr. BOYD. The best answer I can give about tasers is that manufacturers claim to have made some improvements and there is in fact a newer version of it out.

But we did a survey early on when I joined NIJ to find out what law enforcement actually used and how they felt about it. We only found one major department that uses the taser regularly. That is the Los Angeles Police Department. There are a few tasers in lots of other departments, I think about a thousand department in the United States, but we found they were rarely used.

One of the problems with the taser is that both darts have to make contact close enough to the skin to be able to allow an electrical discharge to be conducted through the body. So what we found is that in places further north, and Cincinnati might well be one of these—I don't know what time of the year this happened, but we know it's frequently a problem in the winter.

Mr. CHABOT. It was December, I remember.

Mr. BOYD. In December. OK. In the winter, tasers often fail, because winter clothing is frequently a major problem in making good electrical contact. In Los Angeles, it's not too bad, because most of the year, the person you are going to take on is wearing a T-shirt. So the taser tends to be much more effective in L.A. than in many other places.

They also have some reliability problems. There are problems with keeping them charged, and law enforcement is uncomfortable in many cases with using them. We have been told by law enforcement that they want us to try to develop better ways to control individual subjects. In fact, we're working very hard on that. That is a major focus.

What we are looking at are technologies that can be used to restrain an uncooperative subject, particularly one who is armed with a weapon other than a firearm. We don't believe less than lethal technologies are appropriate against a subject who has got a firearm. But we are looking for other ways to resolve that. I have to be honest and tell you that while we're working very hard to solve this, it's a really tough problem.

You will see an interesting technology down here on the display table, which begins to make some fairly substantial improvements in the bean bags and the other blunt object devices that are designed to be used successfully at distances. We are working in a couple of places to see if we can develop ways to control the velocity of a projectile so that it always strikes at a safe velocity. The problem with rubber bullets like the Israelis use, is that if you are too close, they can kill. If you are too far away, they don't work.

We also have just demonstrated an interesting net device that can be deployed by fairly conventional weapons. It goes out some distance, then deploys as a net so that it can be used over a substantial distance and does some entangling work. We demonstrated it on March 13 at the Montgomery County Police Academy to 100 and some odd police officers as part of a demonstration of all of our technologies. It was very well received, and we think we may be able to make it a more useful kind of device.

We also are looking, and Fred Heineman I think will appreciate this one, at a way to deliver pepper spray safely into confined spaces such as in a room, in a barricade situation, so we can flood the room with pepper spray. A New York police officer recently used a conventional flash hand grenade to break into one place, only to find that there was a baby in a crib in the room. Fortunately, the grenade didn't land in the crib with the baby, but it shook him up pretty badly. So we are working very hard on finding better answers, but trying to handle human beings, especially human beings who are quite often high on any number of combination of drugs, is a fairly tricky task.

Mr. MCEWEN. Let me just say that the law enforcement people on the advisory council have identified less than lethal technologies as probably the most important thing that we are dealing with. We have a separate committee just dealing with the NIJ staff and a number of very good advisers working on that topic alone. So it is being addressed on a regular basis.

Mr. CHABOT. Thank you. One other item I wanted to ask in the time that I have available or left. In the area of bulletproof vests,

do you know what the percentages of police officers nationwide who wear bulletproof vests, and secondly, where are we in that technology as far as making them less hot in the summertime, not heavy, et cetera?

Mr. BOYD. We're not sure how many wear them. We know that there are significantly more now than just a few years ago. We think it's well over a third nationwide, but a lot of that has to do with whether they can afford to get them or not. Of course we know the dramatic saves. We have saved more than 1,800 folks with them.

The Department of Defense just came to us and asked us if we would apply our expertise on their dollar, we always like that approach, to build some baselines for soft body armor so that they can then work jointly with us to try to develop armor which is lighter, softer, more comfortable. As you know, that's a major problem with soft body armor. The blunt reality is, that it's not very comfortable, especially on a hot day.

The body armor that is available for law enforcement right now has already been improved dramatically over what was available just a few years ago. Private industry has probably reduced the weight of that armor about 20 percent in the last 10 years. We are trying to do a great deal to try to make that even more comfortable and even lighter.

Mr. CHABOT. Thank you.

Mr. MCCOLLUM. Thank you, Mr. Chabot. I do not want to do a formal second round because of the time constraints in the second panel. But I know Mr. Heineman wants to ask another question or two. If there are any other Members up here who have a burning question in their pocket, I'd be glad to let them ask it. Mr. Scott do you or Mr. Schiff? Otherwise, I'll go to Mr. Heineman.

Mr. SCHIFF. I have one.

Mr. MCCOLLUM. All right. Mr. Schiff.

Mr. SCHIFF. Thank you for this opportunity, Mr. Chairman. Director Boyd, when I asked about the development of point of sale identification directed specifically to identifying who is trying to buy a firearm from a dealer, you referred to the smart gun technology. That is an important technology. But I'd like to come back to specifically the idea of identifying someone at a specific point. Like to determine instantaneously if someone is a convicted felon through the records.

I am wondering if you could tell me what the status of that kind of technology is at this time, if anywhere. Thank you.

Mr. BOYD. The basic technology to identify a fingerprint, even conceivably a facial identification, already exists. Even now on the Border Patrol, we are taking initial fingerprints and photographs to use to follow up for identification. That technology exists now.

The limitation right now is the infrastructure, so that you can do that say on a local basis, if you had a data base immediately available. What is not yet readily available is the infrastructure to allow you to tie together all of these data bases so that you can make a quick check. It would be, I think, very, very useful to create a system that allowed a very simple application of computer technology, that would permit a point of sale identification to be made by searching the local data base, then the State data base, and fi-

nally, if you haven't found a match, go to a national level data base. You ought to be able to do that quickly, but you need that infrastructure to support it.

Mr. SCHIFF. You believe the technology exists to create the infrastructure if it's funded?

Mr. BOYD. Yes. I do.

Mr. McEWEN. That goes back to my earlier point about the need for a nationwide network of communications. We are talking about both radio and data. That is one of the issues. If we don't have that, you won't be able to really accomplish that.

Mr. MCCOLLUM. Let me follow up if I could to that, Director Boyd. Who would be the right person or agency—would it be you or who—to implement or coordinate that infrastructure, should Congress want to assist in funding? I mean, you have done the research, but is there a place, is there a house we should be looking for for this type of activity?

Mr. BOYD. I appreciate the question, Mr. Chairman. But you have probably asked the single most dangerous question for any bureaucrat to try to answer. The Department of Justice, I think, is going to have to determine who properly ought to handle that. I think there are any number of places in the Department of Justice that could do it. But that is well above my—

Mr. MCCOLLUM. But you could give us an estimate of what it would cost to do this and how long it would take to do it. Could you work on something like that if we asked you to?

Mr. BOYD. Yes, sir. I could certainly do that.

Mr. MCCOLLUM. All right. Mr. Heineman, I think you wanted to have a couple of followup questions. Am I right?

Mr. HEINEMAN. Yes. Thank you, Mr. Chairman. Watching the news this morning, I saw where there was a package, a DNA package that has been developed. I don't know whether it's being marketed or not, but has been developed for about \$30 and turn around time is 8 hours. Are you aware of that?

Mr. BOYD. This is which technology, sir?

Mr. HEINEMAN. DNA.

Mr. BOYD. Yes, PCR. The new PCR technology. In fact, I'm holding in my hand the standards material kit for that technology. You are looking at the package itself. I just finished doing the editorial work on the announcement for this. We will be selling these standards reference packages to laboratories to use to calibrate their testing. PCR is capable of reducing DNA identification time from the current 6 to 8 weeks to about 1 day, and the current \$500 to \$600 per test to about \$30.

Mr. HEINEMAN. You have tested that?

Mr. BOYD. Yes, sir; in fact, we just finished doing the basic work to create the standards reference materials kit to put out in the field.

Mr. HEINEMAN. I think that's great. Now just one question. It has been the question for many years, and it certainly was brought to a head during the Waco hostage situation, if you will. Are there efforts being made to develop a disabling harmless gas to render that type of situation harmless?

Mr. BOYD. At Lawrence Livermore, we have a major project underway. In fact, Dr. Brian Andreson at the forensics laboratory

they have at Lawrence Livermore has been charged with looking at the whole range of incapacitating chemicals to determine which one has the greatest possible margin of safety, how we might go about delivering such a material, and how we might follow up with an antidote quickly enough that we can reduce substantially the risk of death from the application of such an anesthetic agent.

There is no way to deliver such an anesthetic agent with total safety. But we think we can dramatically reduce the risk associated with it now. We are intensely interested in that because as you know, in cases like Waco, it is very tough to bring somebody under control safely.

Mr. HEINEMAN. Thank you. I yield back my time.

Mr. MCCOLLUM. Thank you. Ms. Lofgren, I think you had a followup.

Ms. LOFGREN. A very quick question on the DNA kit. Obviously, the quicker reliable tests can be performed the better for everyone. I am wondering who has validated the tests.

On our Science Committee, GAO did a report on kits to test cholesterol and found that some of the kits in the marketplace had a 50-percent inaccuracy rate.

So we want the test. We want to make sure it's an accurate test. Who has validated the test?

Mr. BOYD. Well, there are two parts to that. This is not a test kit. This is a reference materials kit to calibrate that testing. This is produced for us by the National Institute of Standards and Technology. No one today validates the performance of any DNA laboratory.

We were tasked when the crime bill passed last year with developing a blind test, a way of testing whether or not DNA laboratories could do the job properly. The first funding for that, as we understand it, will be available in 1996. We have already begun to prepare how we are going to go about putting that blind test together and what it will take to implement it.

Only \$250,000 is allocated right now for us to develop the test. It is important enough that we are going to do everything we can to try to make it happen.

Ms. LOFGREN. If I can, I wonder if there's no funding for it, there are certainly other entities that have the expertise to do a validation. Lawrence Livermore Lab, presumably, with their human geno project would have that capacity, as well as a number of other entities, and NIH and the like. Have we reviewed what either the national labs or what other reliable entity could perform that function, other than your agency?

Mr. BOYD. Yes. The issue is not who would be capable of doing the test. It is to develop the test so that we can actually use it in this environment. NIJ would not directly do the development work. Our mission would be to create the mechanism and the process. Then we might do as we do with soft body armor, which means we'd ensure the integrity of the test.

Ms. LOFGREN. Can I ask you then what, I did come in late, what is in that little bag if it's not a test. What does that do?

Mr. BOYD. Actually, this is just the packaging. But in these little vials are basically reagent samples of materials that are used by a laboratory to compare with the products they are using to make

sure that they are going to meet reasonable standards before they pursue the test. You can think of this largely as kind of chemical calibrators.

Ms. LOFGREN. OK.

Mr. MCCOLLUM. Mr. Scott, I understand you have one.

Mr. SCOTT. This is very brief. Is there any suggestion that you'll have minimum standards for DNA labs? Are there any standards now?

Mr. BOYD. There are not now. We are going to approach it in a little bit different way. We have been tasked with finding a way to do a blind test, meaning, that we will try to find a mechanism so that can submit what looks like a real evidence submission to a laboratory where we already know what the results are, and then see if they accurately identify the sample. That is the kind of test we are going to try to develop.

We have also been tasked by the Associate Attorney General's Office in the crime bill with managing the grant program to improve DNA laboratories in the United States.

Mr. SCOTT. Will there be any standards, I mean, what happens if a lab misses 50 percent? How does this ever get in the court if a lab doesn't know what it's doing?

Mr. BOYD. Probably what is going to be required is something much like what as we do with soft body armor. There is nothing in legislation which provides us any authority to follow up and assure the product quality of soft body armor. That's a totally voluntary process. But we publish our results. We publish them to everybody. I think that publishing those results will probably have the same kind of disciplining effect on crime laboratories that publishing information on a failure in soft body armor has on that industry.

Mr. MCCOLLUM. If I might interject at this point, Mr. Scott, that we do have a bill that I have introduced, H.R. 1241, to help redirect some of those authorizations for the DNA laboratories to get the money up earlier and to do a lot of work that I think you probably want to do.

Anybody else have a burning question for this panel? Ms. Jackson Lee?

Ms. JACKSON LEE. Thank you, Mr. Chairman. Director Boyd, you mentioned that there were regional law enforcement technology centers that have been established. Did you give us where they are, or are they established and located somewhere? Where are they located?

Mr. BOYD. OK. There are currently five centers. Four are regional centers. One of them is in Rome, NY.

Ms. JACKSON LEE. Rome?

Mr. BOYD. Rome, NY. One is in Charleston, SC. One is in Denver, CO. One is in El Segundo, CA. The Border Research and Technology Center is in San Diego, CA. With the exception of the Border Center, which is a unique center by itself, each of these centers has gone where they have been because on our budget we had to say, "What are you going to give us in terms of buildings or other resources, if we will come and co-locate it with your facility?" So most of our centers are located with military facilities that have

drawn down and now have vacant buildings in which we could actually house the center.

Ms. JACKSON LEE. Thank you. Thank you, Mr. Chairman.

Mr. MCCOLLUM. Thank you, Ms. Jackson Lee. I just have a question in light of the administration request on the terrorism bill to have a study done of putting taggents in to test or to trace, I guess, the fertilizer out of the Oklahoma City bombing type situation. Would you be the one we should task with that if we choose to do that? Or is this something the FBI would be doing in its laboratories? Do you have any feel for where such a study or such a testing should be done?

Mr. BOYD. If it's a research effort or it's intended to be a research based test to determine how well it works, that is exactly the sort of thing we do. If it is to administer it as a regulatory function, that probably is an ATF function.

Mr. MCCOLLUM. I understand. OK. What it is, I think, a study of whether it works or not. I believe that was the idea behind it.

Thank you very much. I want to thank both of you for appearing today. You have been very good at enlightening us about what is going on in the cutting edge of technology. I think every member of this subcommittee understands the importance of it and wishes we could give you more resources. We certainly want to take away the impediments and provide you the openings and opportunities to get into the air waves where you need to, to do the DNA testing, and all of those things.

So please, whether we are calling you here as a witness or not in front of a hearing, let's keep a regular channel of communication open about what your needs are, and let us know if you have specific legislative needs that we can fulfill, because this is certainly not anything we want to have any road blocks out there, simply because we did not know about it. Thank you very much for coming. Appreciate it.

Mr. BOYD. Thank you very much.

Mr. MCEWEN. Thank you.

Mr. MCCOLLUM. I'll now introduce our second panel of guests today. I'll ask you if you'll come and take your seats in the order that I introduce you, you can go ahead and do that. Our first witness is Dr. Eric Wenaas, president and CEO of JAYCOR, a high-technology research and development company in San Diego, CA. Dr. Wenaas has participated on a number of panels and authored reports on the subject of nonlethal weapons and law enforcement technologies. He is currently involved in developing and testing prototype hardware for potential use by law enforcement and military communities.

Our next witness on this panel is Grady Wright, vice president and general manager of the Integrated Engineering Division of TRW Systems Integration Group located in Fairfax County, VA. The group is responsible for the design, development, and integration of major communications systems, distributed command and control systems and management systems for the U.S. Department of Defense, as well as civil, municipal, and international market places.

Our third witness is Dennis Miyoshi, director of the Nuclear Security Systems Center for Sandia Laboratories in Albuquerque,

NM. Mr. Miyoshi has been employed for 25 years at Sandia, which is a prime contractor to the Department of Energy. His current interests include applying security concepts and technologies developed for the Department of Energy to the security problems of citizens, including in mitigation of crime, fraud, and theft.

Our fourth witness for this panel is Col. Carl Baker, deputy secretary of public safety for the Commonwealth of Virginia Governor's Office of Public Safety. Colonel Baker was appointed in 1994 by Gov. George Allen and is responsible for the oversight of 11 State agencies, including the Virginia State Police Department of Corrections, Emergency Services and Military Affairs. Throughout his distinguished career in law enforcement, Deputy Secretary Baker served as colonel and superintendent of the Virginia State Police, and deputy superintendent and chief administrative officer for the New York State Police.

Our fifth and last witness on this panel is Robert Cansler, chief of police of Concord, NC, Police Department. Chief Cansler's distinguished career in law enforcement and criminal justice include serving as assistant attorney general of the North Carolina Department of Justice, Deputy U.S. Marshal for the U.S. Department of Justice, undercover narcotics officer for the city of Asheville, NC, Police Department, and assistant professor of criminal justice at Western Carolina University.

Before we commence, I'd like to turn to my colleague, Mr. Schiff of New Mexico, who has a desire to welcome one of our guests today who is from his area.

Mr. SCHIFF. Thank you, Mr. Chairman. Briefly, I just want to express, of course, a welcome to all the panel members, but a special welcome to Dennis Miyoshi from Sandia National Laboratories in Albuquerque. I have seen Dennis' demonstration of various devices and technologies under research at Sandia. I think that they have and will make a great contribution to law enforcement.

I would just add, as you pointed out, Mr. Chairman, Sandia National Laboratories is a contractor primarily to the Department of Energy, so are Lawrence Livermore Laboratory and the Idaho National Engineering Laboratory mentioned by the previous panel, which I think underscores the Director's statement in the previous panel about wanting to have a formal kind of arrangement with these laboratories as now exists with the Department of Defense. Thank you, Mr. Chairman.

Mr. MCCOLLUM. Thank you, Mr. Schiff.

Mr. SCOTT. Mr. Chairman.

Mr. MCCOLLUM. Yes. Certainly, Mr. Scott. You have got a Virginian here, I know.

Mr. SCOTT. There are other people that deserve special welcome too. I'd like to welcome Colonel Baker from Virginia who is here with us today. I have known him for many years and look forward to his testimony.

Mr. MCCOLLUM. Thank you, Mr. Scott. Mr. Heineman. I know there's a North Carolinian police chief too. Actually, I'm going to have everybody recognized. I'm going to have to start picking out the others who aren't.

Mr. HEINEMAN. I think you might be right. But I'd like to offer a special welcome to Bob Cansler, Chief Cansler, who was a col-

league of mine when I was chief in Raleigh, NC. Bob has been a breath of fresh air to law enforcement in North Carolina with his legal experience in the attorney general's office. I have shared many meetings with him. I think you are going to be pleased that you invited him. Thank you, Mr. Chairman.

Mr. MCCOLLUM. Now, Ms. Lofgren doesn't represent San Diego, but I don't want Eric Wenaas to think we are not welcoming you. We really appreciate all of you coming out here today.

Ms. LOFGREN. Does that mean I am to say hello both to the doctor and to Mr. Wright, since TRW is in San Diego?

Mr. MCCOLLUM. That's right. We've got everybody. We're happy you are here, but there were special reasons why each Member wanted to say hello. I know all too well how that is when you come from back home.

As we go through the panel, I am going to go in the order in which I introduced you, but I would ask that you summarize and paraphrase your testimony, because we'll never get through the hearing today with what will probably start being votes shortly, if we don't do that. We have your full testimony, and it will be introduced into the record. But if you could summarize or paraphrase, it would certainly help us, allow for the Members to get some questions and to have a dialog, which I know you want. Dr. Wenaas.

STATEMENT OF ERIC P. WENAAS, PRESIDENT AND CEO, JAYCOR

Mr. WENAAS. Thank you. I'd like to thank you for inviting me here to testify today. As the CEO of a company developing high technologies and associated products, I'd like to give you my viewpoint from the industrial side of this picture.

Just as high technology has given a decisive edge to the military on the battlefield, so can high technology give a decisive edge to law enforcement on city streets. There are a number of technologies that are being developed that can make a difference. Some of these technologies include: remote detection of concealed weapons, remote detection of drugs and explosives, remote surveillance with automated reporting to deter crime, to report crime in real time, and to preserve evidence, the stopping of fleeing vehicles in a safe manner, subduing individuals and crowds without using lethal force, and the tagging and tracking of individuals in custody.

A number of these technologies are being pursued. In fact, it was alluded to earlier that we have developed and demonstrated the capability to stop fleeing vehicles safely. We have also developed and demonstrated a liquid stungun that we believe has promise for controlling with nonlethal technology, both individuals and crowds.

However, the police do not have these products in hand today. The question is why. I believe there are two reasons for this. First, law enforcement has not given, in the past, priority to high technologies. High technology has not been viewed as a force multiplier. The classical response has generally been to request more manpower.

No. 2, there are barriers which have prevented industry from acting on its own. I would like to briefly run through, from my viewpoint, what a number of these barriers are, and what the Federal Government might do to help break down the barriers.

First, there's a fractionated market. You heard that 95 percent of law enforcement is at the State and local level. There is basically no focal point for identifying the needs of law enforcement, for identifying the promising technologies that would meet those needs, for setting standards, for performing tests and evaluating products, and to transfer that information to the police departments and to transfer to industry information from the police departments. You heard that NIJ is now acting through these tech centers to do that, to focus the market. Industry applauds that, and hopes that this activity can expand.

No. 2, there are insufficient resources at the State and local level for high-technology devices. Ninety-five percent of the resources at the State and local level are used for manpower, for vehicles, and other support logistics equipment. I don't think that the local and State law enforcement has yet realized the impact that high technology could make. I think if the Federal Government would take the lead to help them demonstrate the difference high technology could make, they then would champion the cause themselves.

So to that end, I would like to see moneys made available at the Federal level specifically for test and evaluation at the State and local level of some of the high technologies, and some funds made available for acquisitions, specifically for acquisition of high technologies. I believe, as stated by Dave Boyd in the body armor case, that after the State and local agencies use high-technology hardware, that they will see the advantage and they will allocate more of their resources to high-technology hardware, as opposed to manpower.

No. 3, the high development cost. You heard earlier that the high development cost is such that it often cannot be amortized over the low volume of sales. For example, we are working in San Diego with the Border Patrol. There are important technologies that could assist at the border, but there are relatively few borders in the United States and there are relatively few border crossings. So those products are relatively limited.

In these cases, the development cost can be subsidized by grants from NIJ, from law enforcement agencies, and also by leveraging from DOD funding in developing dual-use products. These activities have been initiated this year, and industry applauds those too. NIJ can serve to focus these activities.

The fourth and the last one I will talk about is liability. There is almost unlimited liability, especially with regard to nonlethal technologies. Nonlethal technologies are not synonymous with safe technologies. Any technology that uses force comes with risk. Even perpetrators of crime can and have successfully sued manufacturers of equipment as well as the State and local police. It really does not matter whether they win or lose; just the cost of defense far exceeds any of the profits that would be made from these products. Anything that could be done at the Federal level or State and local level that would limit liability for the legitimate use of these products would be welcomed.

Those are the four main barriers from the viewpoint of industry. So to summarize, I think that the Federal Government could encourage and articulate high technology as a force multiplier, could provide leadership to develop high-technology options for State and

local levels, provide resources for amortizing development for test and evaluation, and for disseminating information both ways, to and from industry and law enforcement. And finally, the Government could act to limit product liability. I thank you very much.

[The prepared statement of Mr. Wenaas follows:]

PREPARED STATEMENT OF ERIC P. WENAAS, PRESIDENT AND CEO, JAYCOR

Just as high technology has given a decisive edge to the military on the battlefield, so can high technology give a decisive edge to law enforcement in the battle against crime. The unfolding crisis in crime sets the stage for using high technology — much of it developed for military applications — to solve pressing problems facing law enforcement. Examples of where technology could make a difference are:

- Remote detection of concealed weapons
- Remote detection of drugs and explosives on individuals, in vehicles and within buildings
- Remote surveillance to deter crime and terrorism by automated reporting suspicious activities and by collecting and preserving evidence
- Location and localization of individuals in buildings
- Stopping fleeing vehicles safely
- Subduing individuals and unruly crowds without using lethal force
- Tagging and tracking individuals in custody
- Police officer handguns that cannot be used against the officer.

If the technologies exist to accomplish these goals, the obvious question is: "Where are these products and why aren't they available to law enforcement?" The answer is two fold. First, the government has not placed a priority on developing or acquiring high-technology hardware for use by law enforcement. In sharp contrast to the military, law enforcement has not developed and provided to industry mission needs, developed standards and specifications, centralized the acquisition process, or provided support for a technology base including advanced technology demonstrations.

Second, there exist a number of common barriers that prevent or discourage private industry from developing high-tech products for law enforcement with private resources. I would like to focus on these barriers in the remainder of this testimony, with a view towards suggesting actions the government could take to reduce or eliminate these barriers, and encourage industry to supply useful high-tech products for law enforcement that could make a real difference.

High Development Cost

At one end of the spectrum, there are products with relatively low development costs and prospects for high sales volumes. Industry will naturally gravitate to this end of the product spectrum without government assistance. At the other end of the spectrum, there are products with relatively high development costs and prospects for low sales volumes. Unfortunately, many of the high-tech products needed by law enforcement fall into the high-cost/low-volume category. For example, high-tech solutions exist to safely stop vehicles from crashing through

borders. However, there are only a limited number of border crossings where such a device is needed. In such cases, it is simply not possible to recover the high cost of development with a small sales volume, particularly when the market is as price sensitive as the law enforcement market.

Government can make a difference by providing R&D funds to industry to develop and demonstrate key technologies for law enforcement, particularly those with relatively high development costs that can not be reasonably amortized over the projected sales volume. These funds can also be used to improve manufacturing processes to dramatically reduce the product cost. The Government has already moved in this direction by establishing a new National Law Enforcement Technology Center and associated regional centers, and by providing R&D funds through DoD agencies to develop "dual-use" technologies — that is, technologies which can be used by both law enforcement and the military. Industry applauds these actions, and encourages the continuation and expansion of funding for R&D and development of prototype hardware.

Limited Police Resources

Coupled with the problem of high development cost, is the problem of limited police resources to acquire high technology products. State and local law enforcement represent more than 95% of all police and criminal justice personnel. In this market, most of the budget is allocated for personnel, vehicles and associated logistics support. Only a few percent of the budget is available for hardware, and much of this is used for needs that do not fall in the high-tech category. Consequently, high-tech products that cost more than a few thousand dollars are generally not likely to be well received at the state and local level. Even at this low price there are not sufficient funds to acquire reasonable quantities of high-tech hardware.

Government can make a difference by providing funds at the federal, state, and local level to acquire high-tech products. Funds could be focused to selected federal, state, and local agencies for test and evaluation, and to a wider population of law enforcement for acquisition of specific products. A relatively small amount of money allocated specifically for the acquisition of high-tech hardware could make a big difference.

Fractionated Market

The law enforcement market is scattered throughout the nation at the federal, state and local level. Approximately 95% of law enforcement personnel are employed at the state and local levels. Currently, there are no centralized acquisition agencies, no uniform requirements, no uniform standards and specifications, and no distribution networks suitable for high-tech products of the type mentioned.

A fractionated market with no requirements, no standards, no centralized acquisition agencies or agents, and no suitable distribution network for new products represent a major obstacle for private industry. Part of the problem arises because on the one hand, state and local law

enforcement personnel are not entirely aware of existing technologies and the types of products which could be developed, while on the other hand, private industry is not entirely aware of the needs and priorities of law enforcement. Fortunately, this situation is now changing with the recent emphasis that has been placed on developing technology for use by law enforcement. Recent conferences and exhibits sponsored by the National Institute of Justice (NIJ) and attended by industry, law enforcement, and DoD personnel have been most useful in initiating a dialog.

The Government could make a difference by encouraging appropriate federal, state, and local law enforcement officials to come together to identify and prioritize needs, develop guidelines for product performance, and provide focal points at both state and federal level for acquisition activities. Since it is the Government who is the customer for these products, it is the Government who can and should organize this market to encourage product development by the private sector.

Liability

Non-lethal technologies can be used to stop fleeing vehicles, subdue individuals and mobs, and restrain and control prisoners in ways that are much safer than current means. However, even non-lethal technologies do not come without risk. Any method or technology requiring the use of force can result in injury or death. In such cases, even the perpetrators of crime have successfully sued both law enforcement agencies and occasionally manufacturers of hardware. The threat of lawsuits against manufacturers of equipment — whether used properly or improperly by law enforcement agents — has a chilling effect on manufacturers of such equipment. In fact, some of the non-lethal technologies that are currently being developed may not be offered for sale unless there is a suitable resolution of the liability issue.

The Government could make a difference by taking legislative steps to assure that manufacturers are not liable to the public for hardware approved by, acquired by, and used by law enforcement agencies (except, of course, for product defect). If liability can not be waived, then it should be assumed by law enforcement agencies or government in a manner similar to the liability assumed by the military for hardware developed to their specifications.

Fourth Amendment Issues

Remote sensing technologies can be used, for example, to detect concealed weapons carried illegally on city streets, or illicit drugs carried in vehicles. These technologies, which could form the basis for probable cause for a search, raise interesting questions with regard to guarantees of right to privacy and prohibition from unreasonable search and seizure. From a manufacturers view point, it would be advantageous to have these issues resolved before making a large investment in developing a product, the use of which may be later prohibited on constitutional grounds.

It is not entirely clear how the Government can help resolve Fourth Amendment issues. It is quite likely that they will be decided on a case by case basis depending on the technology and how it is used. Furthermore, the courts will undoubtedly be involved in the ultimate resolution. The Government could best help by evaluating key technologies, by providing opinions with regard to Fourth Amendment issues, and by providing guidelines for product development and usage to maximize the probability that they will pass legal challenges.

Patents and Data Rights

Commercial products developed by private industry are generally protected by the existing patent and data rights laws. In many cases, patents and data rights on technology developed for the military are assigned to industry to encourage product development for commercial applications. The assignment of patents and data rights becomes more complex for products which have been developed with a mix of private capital and Government funding, particularly when the ultimate consumer of the product is the Government. This issue will become increasingly important to industry as Government funds are used by industry to assist in developing commercial products for law enforcement.

The Government can make a difference by allowing and encouraging private organizations who elect to invest a substantial amount of their own resources in new product development to retain patents and data rights, even though the Government supports the development of the underlying technology, provides resources to test and evaluate the product, or provides resources to improve the product to meet Government requirements or standards. This is an area with a great deal of latitude which could be influenced greatly by public policy statements, if not by law.

Summary

I would like to conclude this testimony by restating that there is a unique opportunity to use existing technology for developing high-tech products for law enforcement which can make a real difference in the fight against crime. To capitalize on this opportunity, it will be necessary for the Government to: 1) provide R&D resources for product development, and additional funds to state and local agencies specifically for product acquisition, 2) focus the market by prioritizing needs, setting standards or guidelines, and providing a more centralized acquisition process, and 3) encourage private industry by helping to minimize risks associated with product liability, Fourth Amendment issues, and patent and data rights.

Mr. McCOLLUM. Mr. Wright.

**STATEMENT OF GRADY C. WRIGHT, VICE PRESIDENT AND
GENERAL MANAGER, TRW**

Mr. WRIGHT. Mr. Chairman, distinguished members of the subcommittee, I would like to thank you also for the opportunity to testify before you. I am quite pleased to be here today to discuss new and emerging public safety and law enforcement technologies. Public safety of course is of foremost concern as we struggle to improve the quality of life for our citizens.

State, local, and Federal Government agencies are searching for ways to reduce crime effectively and economically. They are increasingly turning to technology to provide automated systems and solutions. In essence, technology, when correctly applied, functions as a force multiplier, reducing the number of people required to perform a specific task, thereby freeing up resources for other missions, such as more street patrols.

Delivering technology to the law enforcement arena is no different than how we delivered it for other major systems in the past. TRW has a long history of using technology as a force multiplier in serving our country. One of our founding fathers, Dr. Simon Ramo, was asked by President Eisenhower in 1953 to serve as a chief scientist to develop the Intercontinental Ballistic Missile Program. The technology associated with that program in the context of engines and gyroscopes and accelerometers, computers and radios and radars involved in the guidance and control of missiles and the transmission of information about them all had to be enhanced by factors of 10 in its improvement over the current state of the art. At that time, the team, which was led by TRW, met that technical challenge.

Of course this is the kind of activity that we are thinking and working on today, through that legacy. It has enabled us to develop an efficient framework to transfer products and expertise used in our defense programs, to solve problems associated with public safety.

The mere existence of technology, however, will not solve the complex problems facing our law enforcement officials. Rather, it is how technology is applied that is the key. Proven systems engineering and integration skills have enabled companies such as TRW to apply new and emerging technologies successfully to meet the wide variety of challenges, including public safety problems. We have amassed vast experience in the fields of command and control centers, communication centers, and software engineering. TRW is designing, developing and integrating numerous public safety projects worldwide by applying these proven existing technologies to Federal, State, local, and international automated systems.

Using technology as a force multiplier for public safety works when two key ingredients are present. First, we must involve the customers. Second, we must have adequate resources. The customers are the detectives, the police officers, the fingerprint specialists, or the office workers performing particular tasks which can be enhanced by technology. They understand the problem, and they likely know how to work more efficiently if they had the appropriate tools. We have achieved our greatest success when we have

engaged our customers from the outset of a program through the development and training process.

Resources are critical. As in the case for almost every other area of government, America's law enforcement agencies are operating on very tight budgets. It is difficult to fund long-term investments, even though the returns may more than justify the initial outlays. Federal funding is one way to ensure that vital technology is brought to bear in solving vital public safety issues. However, State and local governments also must be willing to consider the strategic impact on law enforcement of such technology investments and make the decision to provide the necessary funding.

I want to describe to you two examples of how people, technology, resource management have been used to constitute an effective force multiplier. There was a lot of discussion earlier, in the earlier questioning with regard to the automatic finger print identification systems, which I will talk about, or AFIS. Another is a system called modus operandi registrant computer or MORC.

TRW's AFIS is designed to meet the needs of law enforcement agencies at all levels. Our system takes fingerprints in various formats and renders them digitally. The electronic images are then compared to a data base for verification and identification, a process that is performed in a matter of seconds. Depending on the application and configuration, this data base can contain fingerprints stored locally or the system can be linked through electronic networks, communication networks, to fingerprint data bases around the world.

Law enforcement agencies execute thousands of books per year, a high percentage of which consist of individuals with prior records. In most cases, present day verification is performed by using suspect's names. Positive identification using fingerprint matching techniques takes days, and sometimes weeks. Quite frankly, suspects being held may be released before identification of previous criminal history records can be made. Implementation of an automated fingerprint identification system virtually precludes wrongful arrest, and increases the efficiency and productivity of work flow within the law enforcement agency.

AFIS can be easily scaled to fit the requirements of any sized automated identification system. For example, in Santa Clara, CA, four law enforcement agencies participated in a TRW installed countywide network fingerprint identification systems, called CONFIRM. This was one of the first programs in the United States to provide fingerprint identification information in near real-time to remote sites, at the point of booking, including two police stations, the county sheriff, and the county jail. The data base contained approximately 200,000 fingerprint cards when the system was fully complete, fully operational.

TRW is also developing and installing an automated fingerprint identification system for the State of Ohio. The new system links law enforcement agencies at various locations in the State of Ohio's Bureau of Criminal Identification and Investigation's Master Fingerprint File Facility. When operational, it will have a million fingerprints in its data base.

We are also completing an 18-month concept definition contract for the FBI Criminal Justice Information Services Division, with

the design of a processing system for their automated fingerprint identification system. That program will search and match 10-print fingerprint identification cards and latent prints against a data base of approximately 32 million individual records. The AFIS system, by the way, is a component of the larger FBI Integrated Automated Fingerprint Identification System, called IAFIS.

Internationally, the British home office of the United Kingdom earlier this year selected TRW to design and implement their national automated identification system. This system will connect the home office with 43 police forces throughout England and Wales, enabling law enforcement officers at these sites to capture 10-print and scene of crime marks or latent fingerprints, and electronically submit the images to the national data base for identification and verification.

Another example of using technology as a force multiplier is a TRW program called *modus operandi* registrant computer, or MORC. Typically, law enforcement officials collect the information at a crime scene, and begin then the arduous task to process or manually searching the numerous case files and seeking patterns and linkages among the crimes. With MORC, police can match the details of a specific crime to other crimes that are recorded in a data base system, sort of an artificial intelligence system to do that.

Based on the finding that many offenders follow the same method of operation, *modus operandi*, in their crimes, MORC uses specific crime details to perform an exhaustive search of all possible suspects who are in the data base. As part of its software, MORC is programmed to automatically ask a range of questions, key questions, thus saving the investigator's time. During a recent 12-month test phase, MORC assisted the San Jose Police Department's sexual assault investigative unit in solving several new and previously unsolved sexual crimes by providing valuable background information on similar crimes, and a list of possible suspects.

Just as technology has enabled and enhanced the effectiveness of the U.S. military power for many years, I believe our technological capabilities can be used to leverage and strengthen vital law enforcement functions. Applications of technology such as I have described, which I would like to describe as soft technology, by the way, will require some initial expenditures no doubt. But the savings in terms of law enforcement manpower or resources and in peace of mind for our citizenry will provide ample return on those investments.

Thank you. I look forward to answering any questions you might have.

[The prepared statement of Mr. Wright follows:]

PREPARED STATEMENT OF GRADY C. WRIGHT, VICE PRESIDENT AND GENERAL
MANAGER, TRW

Mr. Chairman, distinguished members of the subcommittee, I would like to thank you for this opportunity to testify before you. I am quite pleased to be here today to discuss new and emerging public safety and law enforcement technologies. Public safety is of foremost concern as we struggle to improve the quality of life for our citizens.

State, local and federal government agencies are searching for ways to reduce crime effectively and economically, and they are increasingly turning to technology to provide automated solutions. In essence, technology, when correctly applied, functions as a "force multiplier," reducing the number of people required to perform a specific task, thereby freeing up resources for other missions, such as more street patrols.

TRW has a long history of using technology as a force multiplier in serving our country. In 1953, President Eisenhower asked Simon Ramo, one of TRW's founding fathers to serve as Chief Scientist to develop the Intercontinental Ballistic Missile (ICBM), a program more vast and complex than the Manhattan Project that built the atomic bomb. Engines, Gyroscopes, accelerometers, computers, radios, and radars involved in guidance and control of the missile and the transmission of information about its operation would all have to be enhanced by factors of ten or more over the current state-of-the art. The TRW team succeeded in meeting that daunting technical challenge. More recently, we have developed space and automated computer systems for the Department of Defense that have led the world in technological sophistication. These programs integrated state-of-the-art or existing technology into workable solutions, which reduced manpower requirements, freeing up the warfighter for more important activities. This legacy has enabled us to develop an efficient framework to transfer products and expertise used in our defense programs to solving problems associated with public safety.

The mere existence of technology will not help solve the complex problems facing our law enforcement officials; rather, it is how technology is applied that is the key. Proven systems engineering and integration skills have

enabled companies such as TRW to apply new and emerging technologies successfully to meet a wide variety of challenges including public safety problems. We have amassed vast experience in the fields of command and control centers, communication systems, and software engineering. TRW is designing, developing and integrating numerous public safety projects worldwide by applying these proven, existing technologies to federal, state, local and international automated systems.

Using technology as a force multiplier for public safety works when two key ingredients are present: first, involving the customers, and second, adequate resources. The customers are the detectives, police officers, fingerprint specialists or office workers performing particular tasks which can be enhanced by technology. They understand the problem, and they likely know how to work more efficiently if they had the appropriate tools. We have achieved our greatest success when we have engaged our customers from the outset of a program, through the development and training process.

Resources are critical. As is the case for almost every other area of government, America's law enforcement agencies are operating on very tight budgets. It is difficult to fund long-term investments, even though the returns may more than justify the initial outlays. Federal funding is one way to ensure that vital technology is brought to bear in solving vital public safety issues. However, state and local governments also must be willing to consider the strategic impact on law enforcement of such technology investments and make the decision to provide the necessary funding.

I want to describe two examples of how people, technology and resource management have been used to constitute an effective force multiplier: the automated fingerprint identification systems, or "AFIS" and the Modus Operandi Registrant Computer or "MORC."

Automated Fingerprint Identification Systems (AFIS)

TRW's AFIS is designed to meet the needs of law enforcement agencies at all levels. Our system takes fingerprints in various formats and renders them digitally. The electronic images are then compared to a database for verification and identification, a process that is performed in a matter of seconds. Depending on the application and configuration, this database can contain fingerprints stored locally or the system can be linked through electronic networks to fingerprint databases around the world.

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of previous criminal history records can be made. Implementation of an automated identification system, virtually precludes wrongful arrest, and increases the efficiency and productivity of work flow within the law enforcement agency.

AFIS can be easily scaled to fit the requirements of any sized automated identification system. For example, in Santa Clara County, California, four law enforcement agencies participated in the TRW-installed County-wide Networked Fingerprint Identification System (Co.N.F.I.R.M) pilot program. This was one of the first programs in the United States to provide fingerprint identification information in near real-time to remote sites, including two city police stations, the County Sheriff and the County jail. The database contained approximately 200,000 fingerprint cards when the system was fully operational.

TRW is also developing and installing an Automated Fingerprint Identification System for the State of Ohio. The new system links law enforcement agencies at various locations in the state to Ohio's Bureau of Criminal Identification and Investigation's Master Fingerprint File facility. When fully operational later this year, the system will have approximately one million sets of fingerprints in the database.

We are also completing an 18-month concept design contract for the FBI's Criminal Justice Information Services Division, with the design of a processing system for their Automated Fingerprint Identification System (AFIS) program. That program will search and match "ten-print" fingerprint cards and latent prints against a database of approximately 32 million individual records. AFIS is a component of the larger FBI Integrated Automated Fingerprint Identification Systems (IAFIS).

Internationally, the Home Office in the United Kingdom earlier this year selected TRW to design and implement their National Automated Fingerprint Identification System (NAFIS). This system will connect the Home Office with 43 police forces throughout England and Wales, enabling law enforcement officers at these sites to capture ten-print and scene-of-crime mark or latent fingerprints, and electronically submit images to a national database for identification and verification.

Management Information Systems

Another example of using technology as a force multiplier is a TRW program called Modus Operandi Registrant Computer, or MORC.

Typically, law enforcement officials collect the information at a crime scene and begin an arduous process of manually searching innumerable case files seeking patterns and linkages among the crimes. With MORC, however,

police can match the details of a specific crime to other crimes that are recorded in the data base system. Based on the finding that many offenders follow the same method of operation (MO) in their crimes, MORC uses specific crime details to perform an exhaustive search of all possible suspects who are in the data base. As part of its software, MORC is programmed to automatically ask a range of key questions, thus saving the investigator's time. During a recent 12-month test phase, MORC assisted the San Jose Police Department's Sexual Assault Investigative Unit (SAIU) in solving several new and previously unsolved sexual crimes by providing valuable background information on similar crimes and a list of possible suspects.

Just as technology has enabled and enhanced the effectiveness of U.S. military power for many years, I believe our technological capabilities can be used to leverage and strengthen vital law enforcement functions. Applications of technology such as I have described will require some initial expenditures, no doubt; but the savings – in terms of law enforcement manpower, resources, and in peace-of-mind for our citizenry – will provide ample return on those investments.

I would be happy to answer any questions that you or the other Members of the Subcommittee may have at this time.

Mr. SCHIFF [presiding]. Thank you very much, Mr. Wright.
Mr. Miyoshi.

STATEMENT OF DENNIS MIYOSHI, DIRECTOR, NUCLEAR SECURITY SYSTEMS CENTER, SANDIA NATIONAL LABORATORY

Mr. MIYOSHI. Congressman Schiff, distinguished members of the subcommittee, as was mentioned, my name is Dennis Miyoshi. I am the Director of the Center for Nuclear Security Systems at Sandia National Laboratories. The purpose of my organization is to provide physical security, research, and development for the Department of Energy, and to provide security system engineering concepts for the protection of the Department of Energy nuclear materials, nuclear weapons, and nuclear facilities. We have been in this business for over 20 years, and have done a number of projects not only for the Department of Energy, but also for the Department of Defense.

As you have heard from a number of the panelists, there are a tremendous number of technologies that are available. What I wanted to concentrate on a little bit here this morning was to discuss another aspect that I think is very important when you start talking about security. That is, the issue of treating security from a systemic point of view, from a systems engineering perspective.

When you start doing systems engineering and applying it to security systems, what you do is you optimize your protection and at a reasonable cost. Let me just touch base very briefly on several of the elements that I think are particularly relevant to this particular issue.

The first one is systems analysis, in understanding the total picture from a systems perspective, developing models that apply to your particular problem. This enables you to be proactive as opposed to reactive. Too many times in our present day environment from a security perspective, we are reactive instead of proactive.

The second item that I would like to touch on is testing and standards. We have heard that mentioned several times today. One of the problems is that we have a number of needs coming into the National Institute of Justice and others. These need to be translated into requirements. The industry, security industry is fragmented. The security industry desperately needs to know what requirements need to be met so that they can deliver the optimal product and still make a profit.

In addition, this particular market, as has been mentioned, is also fragmented, so you have got 17,000 potential entities that want to buy equipment. They are looking for standards. They are looking for certification. They are looking for criteria that they know these products have met. So between the suppliers and the users, there's a tremendous need for some sort of overarching standards and testing.

Next is training. None of this equipment is going to be used properly if there's not adequate training, support of adequate training. In fact, technology today, virtual reality, can help a great deal in providing that kind of training to the officers.

Finally, technology cannot exist by itself. It has to be accompanied by procedures and processes. By working these two things

together, we in fact will develop synergy and enhance the effectiveness of both.

Let me just give you a short example of how systems engineering can be applied. The terrible tragedy in Oklahoma City is a good example of that. After that particular incident, a number of folks came up to me and mentioned that, hey, how can we address this problem without destroying the basic freedoms that we all enjoy. My comment to these folks were that we need to think more broadly.

We need to think of this whole issue as a total system problem. We need to think of it in terms of several factors. One being deterrence, another being prevention, and this is where most of the people will focus on, how can we detect explosives, how can we prevent something from happening. We need to think about mitigation. We need to think about how we can mitigate the effects of explosives by looking at how we build buildings, how we make them more safe, secure, as well as functional.

Finally, we need to think about apprehension and prosecution, because if we do that job very well, we will in turn provide a great deal of deterrence.

By looking at all those issues, and some of them are technical, some of them are procedural, some of them involve intelligence operations, we can put together an overall system that by combining these all together at a much lower level, we'll achieve in fact greater effectiveness.

Let me now turn to technologies. These technologies when you apply them to law enforcement certainly have to be very safe, very secure, and very reliable. That common theme of safety, security, and reliability needs to permeate anything that we bring to our law enforcement personnel. In addition, as has been mentioned earlier, these are tools. As a farmer uses tools to increase productivity, so the law enforcement officer will use security technologies to save their time, to save money, and perhaps most importantly, to save their own lives and the lives of our citizenry.

We need to be looking at high leverage items. That is why systems engineering is so important. It will help us identify those high leverage items that in fact will provide us our greatest benefit for the dollar invested.

There were many technologies that were mentioned today. One that I haven't heard much on is explosive detection. We are well aware that explosive detection devices do exist commercially, but they are primarily aimed at the aviation industry to date. It is my belief that these technologies can be adapted to vehicle portals, to be able to detect the presence of explosives in vehicles.

We have talked a little bit about tracking technologies and how they can be used for probation and parole. I am constantly reminded that in today's environment, spousal abuse is a great concern of ours. There are many restraining orders that are issued by the courts. Tracking systems, monitoring systems, as have been mentioned earlier, would be a great addition to preventing spousal abuse, particularly involving restraining orders.

We have talked about the less than lethal program. We have several instances of less than lethal technology here. The sticky foam. We are also looking at aqueous foam that can be used in riot con-

trols. Forensics is another area that can be very useful in terms of looking at things after the fact, providing deterrent.

Another item which has been mentioned is captured in the smart gun. That is the concept of use control. Utilizing identification of personnel, are these people indeed in fact authorized to use this equipment. It's captured very well in the smart gun.

We have talked about information systems. The key point here I think is that we all recognize that information systems is a great liberator, will enable us to increase our productivity. We need to make sure that information can be shared.

Finally, in the area of personal identification, we have talked about very good systems in fingerprints. I'd like to also offer that the banking industry is strongly considering smart cards. The idea here is to be able to identify personnel or have personal identification associated with a card that can be carried around with the individual to be able to access their financial assets. If you know the banking industry, financial industry, you'll know that there's going to be a lot of security built into that.

Finally, just a comment on liabilities that was mentioned earlier. It is very interesting to me that the sticky foam, one of the key inhibitors of using sticky foam within the United States is the liability issue. The military took this material to Somalia. We talked to our lawyers about the liability issues there. We are told that it's not a problem because it's being used overseas as a part of military operation. It clearly benefited our Armed Forces in Somalia in keeping the peace there. It was used very effectively. Again, as pointed out, that is the key obstacle to us using such devices here in the United States.

In summary then, I believe that the Federal Government can greatly facilitate the use of technology, making it available to law enforcement personnel, which will result in a higher level, much higher level in public safety and personal security. When you talk about these issues, of course, we are all involved in this. It is not just law enforcement people. We are the eventual benefactors. Thank you very much.

[The prepared statement of Mr. Miyoshi follows:]

PREPARED STATEMENT OF DENNIS MIYOSHI, DIRECTOR, NUCLEAR SECURITY SYSTEMS
CENTER, SANDIA NATIONAL LABORATORY

Chairman McCollum and distinguished members of the committee, I am Dennis Miyoshi, Director of the Nuclear Security Systems Center at Sandia National Laboratory. Today I am speaking for the National Institute of Justice as part of their Symposium on Law Enforcement Technology for the 21st Century.

INTRODUCTION

Thank you for the opportunity to share my views on new developments in technology that have potential application in the fight against crime. I will first review several systems engineering aspects of technology development and then several categories of technologies, and comment on their applications to Law Enforcement and Corrections.

SYSTEMS ENGINEERING

Let's first turn our attention to several elements of systems engineering. Systems engineering is an interdisciplinary activity that ensures that the customer's needs, including safety, security, and reliability, are satisfied throughout the entire system life cycle. Activities include: understanding customer needs, stating the problem, specifying requirements, defining cost and performance figures of merit, prescribing tests, validating requirements, exploring alternative concepts, sensitivity analysis, functional decomposition, system design, designing interfaces, configuration management, risk management, total quality management, project management, and documentation.

Effective security systems require thorough analysis of needs, potential solutions, and costs, leading to integrated system design involving reliable interaction between many components and various personnel, with attention to operational procedures, maintenance, and performance testing. Effective systems not only do their intended function, but are safe, secure, and reliable.

Daily, our nation becomes more and more interconnected by such means as our national information infrastructure. Our problems, including those related to crime, are becoming more complex. Solutions to such diverse problems as Medicare/Medicaid fraud, public safety in public places, security in our public schools, electronic financial transaction fraud, privacy of personal electronic information, and the need for safe and efficient transportation systems require high levels of safety, security, and reliability.

Systems Analysis

Analysis and evaluation are necessary ingredients in developing solutions to our crime and criminal justice problems. Before any application of technology to one of today's problems, we must analyze and determine our overall objectives. An application of technology without an analysis of the problem is usually a waste of money.

How does the process or facility operate? What are its components, their attributes, and how do the components fit together? What threat are we trying to alleviate? What resources and motivation do our adversaries have? What are we trying to protect or to accomplish? When we make a change to our security system, how do we quantify the benefit bought and compare it to the price paid? Across the country, many security products are being bought in the wake of incidents such as the Oklahoma City and the World Trade Center bombings. Much too often, these products do not improve security or do so only marginally.

Through the use of modeling, simulation, and analysis tools and methods, we could better understand the effects of decisions we make about such things as the Southwest Border and its protection from both drug traffic and from illegal crossings, the impact of new sentencing guidelines, credit card fraud, access control systems for airports, and prison upgrade options.

Testing and Standards

Security equipment and systems should be adequately tested to assure proper installation and proper operation. In addition, standards and certification programs should be developed, where appropriate, for security systems, much as they currently exist for building fire-safety systems. Today's local Law Enforcement agency is inundated with false alarm calls to private residences and commercial businesses. Surely our technology can be combined with proper certification and standards to improve this situation and to relieve our overworked Law Enforcement resources.

Technologies such as robotics could help us to automatically test sensors or to remove humans from dangerous situations while efficiently getting the job done.

The results of many past and current tests determining the effectiveness of physical security technologies could be used to guide us into better systems for tomorrow.

Training

Technology, as well as technical experts, could be used to better train our criminal justice personnel. For example, Law Enforcement officers could be trained with virtual reality systems to better respond to infrequent, but dangerous, events. Likewise, Corrections Officers could be trained with virtual reality systems to do better drug searches in cells and day rooms.

More opportunities for security professionals could be developed through M.S. and Ph.D. programs in security systems engineering. Architectural engineering programs could include courses that train students in development of deterrence aspects for their designs, in the use of detection and assessment components in buildings, in blast resistance architecture of buildings, and in many other systems aspects that will make our buildings more resistant to criminal acts, as well as more functional.

VARIOUS COMPONENT TECHNOLOGIES

Now, let us turn to specific security technologies that show potential for helping Law Enforcement and Corrections.

Many new security products are becoming available, such as fiber optic sensors and extremely small cameras that make surveillance activities look like what you see in the movies. Tomorrow's security and surveillance technology could include remote audio surveillance systems, biological and chemical bomb sensors, concealed weapons detectors to quickly locate weapons in a crowd, and human presence detectors to find hidden people inside buildings or in dark alleys.

Contraband Detection

Technologies in the area of contraband detection are growing. For example, technology can be used to detect drugs, explosives, weapons, and other contraband. We have long and effectively used metal detectors at airports; these devices could be improved to detect even better with fewer false alarms, thus improving throughput at the airport checkpoint.

Explosives detectors fall into two basic categories -- vapor detection and bulk detection, which is typically enhanced x-ray or cat scan technology. This technology is improving. However, much work remains to be done in this area, as we design better vapor-collection portals and better detection devices. Technology is now available that could be developed into vehicle-based explosives detectors at the entrance to parking garages and at border crossings.

Drug detection is very similar to explosives detection. Technologies appropriate for one are often good for the other. Vapor detection technologies for explosives show promise for drug detection. Low-dosage x-ray scanners can find both explosives and drugs. Tomorrow's drug detectors will help us at our borders and in our prisons.

Tracking Technologies

We could use sophisticated tagging, tracking, and monitoring technologies to supervise various activities, including offenders on probation and parole who require intensive supervision. This could better leverage our often overworked probation and parole officers. Technology could make such devices tamper protected, or at the very least, tamper indicating.

Tracking or tagging systems could be developed to automate bed check counts in prisons or to cost-effectively track all people inside a prison. Vital signs could be monitored remotely.

Less Than Lethal Weapons

Less-than-lethal weapons technologies -- including chemical foams and sprays, entanglements, and electromagnetics -- will permit us to stop offenders without killing them, to more gently stop fleeing cars, to better extract prisoners from their cells, to make the Corrections Officer in a prison much less vulnerable, to improve our response to hostage situations, to better control the violent offender, and to stop prison riots without violence.

Forensics

Forensics technology can be improved to allow elemental analysis of biological specimens at cellular levels. Microscopic particles can be added to explosives and then detected through forensic analysis of trace amounts.

Use Control

Use control technologies could allow us to prevent others, especially children, from using our weapons. Similar technology could help us to protect our private information from those without a need to know. Such technology may include various electronic systems, as well as biometric systems that identify unique characteristics of individuals.

Information Technology

Information technology will allow us to turn our voluminous data into the useful information we need. Speedy and accurate information will allow us to solve crimes quickly, sometimes even giving us advance warning before the crime itself occurs. Turning the over-stuffed filing cabinets in our criminal justice system into an efficient criminal justice management information system will improve efficiency and make sure that offenders don't walk away free, simply because we lost track of their paperwork. Booking in the field will be quicker and more accurate. Stolen or wanted vehicles could even be identified automatically by passing patrol cars. Information of all types will be easier to access and to use.

Personal Identity Verification

Personal identity verification technology could permit various security applications, especially in the area of entry control. Technologies such as eye retina scan, iris scan, hand geometry, voice recognition, signature verification, fingerprint identification, and intelligent facial recognition will uniquely identify persons as they seek access to facilities and systems. Alien criminals and repeat offenders could be quickly identified.

SUMMARY

Today, I have talked about a broad array of systems engineering topics and technologies that could make our Law Enforcement and Corrections activities more effective. These technologies are in various stages of development. Some are only promising concepts; some are in research and development; some are in the manufacturing pipeline, but haven't been fully tested or found wide-spread acceptance.

These technologies, and many others, offer tremendous opportunities for how we as a nation deal with crime and criminal justice. However, they also offer opportunities for abuse and misuse and must be used wisely. We must use them intelligently, but only as appropriate, and as part of well-engineered systems that are designed to be safe, secure, and reliable.

Mr. SCHIFF. Thank you, Mr. Miyoshi.
Colonel Baker.

**STATEMENT OF COL. CARL R. BAKER, DEPUTY SECRETARY OF
PUBLIC SAFETY, GOVERNOR'S OFFICE, COMMONWEALTH OF
VIRGINIA**

Mr. BAKER. Thank you, Congressman Schiff and members of the committee.

I see my job on the Advisory Board for the Law Enforcement Technology Center to be a reality check. I am going to stray from my testimony just to explain a few things to you so you understand exactly where we are in law enforcement.

Probably the worst case scenario would be that Congress provides the money for a technology and it does not produce the results that you are wishing for. The problem is that many problems arise when technology is built on myths or presumed facts that just aren't occurring. For example, there is no such thing as a national fingerprint file. For years and years, people have believed that there is a national fingerprint file. That is not true.

I will give you a sample case. A prostitute jumped by a trucker on an interstate highway. The first step in any homicide investigation is to identify the victim. Police identify the victim by a number of ways—teeth, where you have to have a pretty good idea of where they are from, or fingerprints. You run the fingerprints through the "national" fingerprint file. You do not get a hit. The reason being is that many States are not even sending their fingerprints to the FBI anymore, because they have an automated fingerprint system. They digitize their prints. The FBI for years only accepted card-board prints.

So there is no such thing as a national fingerprint file. In fact, some of the States are banding together, California area for example, to develop an interstate system called WIN, Western Identification Network. So as a police officer now trying to identify a homicide victim, you have to get those prints and send them to every State and ask every State to run them through their system. Just so I don't keep you guessing, the closure of this story is that the prostitute was earlier arrested in Texas. We finally got a hit in Texas, were able to identify her and later made an arrest. It took several weeks to do that.

Additionally, in answer to some questions by Congressman Scott earlier, we talked about instant checks and weapons checks. Let me tell you, another myth is that every felon is fingerprinted. That is not true. There are 18,000 wanted felons in the State of Virginia right now that are not in the National Crime Information Center [NCIC] files or Virginia criminal file system. They have not been entered in the computer. Now why aren't they entered in the computer? We have talked to the chiefs. They say they don't have the man-hours.

So if you are doing instant checks for weapons, there are 18,000 felons that are not even entered into that computer that you are checking. Additionally, there are States, and I'm not going to name the States, but there are States it takes 540 days from the time of arrest to the time of disposition before that is even entered into a computer or into a triple I, what we call the interstate identifica-

tion index (III), which is the criminal history files. So you've got 540 days where that felon can be out there doing things that he is not permitted to do, such as purchasing weapons or working in a daycare center.

The biometric system is a great way of checking and making sure you have positive identification, but that requires that you put a fingerprint in the hot files, in the wanted files, for the subject that's wanted. Or, you have to have a match in the triple I (III) file.

If we are not fingerprinting felons now, and many times we don't even have the fingerprints on the subject, but you are still going to have to go back to the name check to make sure that you're not letting a felon go. So there are problems with developing technology that relies strictly on, for example, inserting a finger into a black box, and believing that the technology works. It has been tried by the FBI. It works in principle. It is a part of NCIC 2000. But if you do not have the fingerprints of the felons that are wanted, let alone arrested, on file, this system is no good.

Part of my presentation was just to tell you how important it is that the technology to be developed is affordable by police departments. To give you an idea about a regular or what we would call a typical State police budget or police budget, 80 to 85 percent of that budget is for personnel and overtime. Ten to twelve percent of that budget is for vehicles, fuel, and maintenance, and about 3 to 5 percent is for communications. What that leaves is approximately 3 to 7 percent for everything else. So that is why many departments cannot afford the technology that's available today.

Presently, the fuming wand and pepper spray are literally adopted by every police department in the country. Empirically, they can be measured on what they do. A good example, there are substantially less injuries to officers and to defendants as a result of the use of pepper spray. Additionally, the fuming wand has reduced the time it takes to take latent fingerprints from a crime scene by at least one-sixth.

The other point I want to make in terms of technology is that I think everyone has to understand exactly what drives a police administrator's decision on whether to purchase or not purchase new technology. Certainly priority—how important is it to the overall operations of this department. You have to show to the city council, State government or county government, that what you are buying, what you are purchasing is going to result in some benefit to the citizens. Cost—if the initial cost of the technology does not hold you back, but really, how much does it cost to maintain that equipment, how many does the department need.

For example, we talked about devices for stopping high-speed chases. Congressman, that's a very important piece of equipment. But when you are running a fleet of 2,000 vehicles, can you afford to equip every car with that type of technology. Or if you are going to use barrier strips, where do you deploy them for example, in the State of Virginia, to eliminate high-speed chases. How many do you need to have out there? Are there any hidden costs? Do you have to increase your manpower for that technology? Do you have to do a computer upgrade to introduce that technology?

Third, what are the benefits of that technology in terms of real money or real man-hours. What are you saving? Will street officers be better able to serve the community by using that equipment? What is the value added to that technology?

Training, Dennis mentioned training. How much training is required to use that equipment? Again, how much training for the individual police officer. It has to be relatively simple or the street police officer will totally ignore it. Last, how will the courts view the use of technology, and what constitutional issues will arise from the use of that technology?

Last, there were a number of questions about exactly where we should be going in terms of technology. As a representative of law enforcement, as many other people on the committee have stated, the remote weapon detection is a No. 1 priority. That and less-than-lethal technology is a No. 1 priority for policemen. The remote weapon detection is probably the most important. I assure you that once that technology is developed, it will be used by the street officer.

As I said, less-than-lethal technology is important. Reduction of high-speed pursuits is very high on the list. Officer protective devices, and last, evidence collection. As you can see from the O.J. Simpson trial, we have some improvements to make in the evidence collection area. The fuming wand is just one example of that.

In closing, let me state something that we all recognize, that government is changing dramatically. We can no longer afford, nor will we be permitted to operate government as we have in the past. As the chairman said earlier, we have to learn to do more with less. But again, it's easier to do more with less with the introduction of new technology. However, we all have the responsibility to ensure that whatever new technology is developed is both practical and affordable for the law enforcement community, and does not build on a system that is not working properly already. Thank you very much.

[The prepared statement of Mr. Baker follows:]

PREPARED STATEMENT OF COL. CARL R. BAKER, DEPUTY SECRETARY OF PUBLIC
SAFETY, GOVERNOR'S OFFICE, COMMONWEALTH OF VIRGINIA

Most police departments feel themselves to be slowly drowning in a rising tide of drugs, serious crimes, and 911 calls. Yet, while workloads have risen dramatically in recent years, resources (personnel, funds, and equipment) have at best remained constant, but in all likelihood have decreased.

Government "downsizing" or "right-sizing" at all levels has forced a new meaning to the phrase - "do more with less." Law enforcement agencies have not been exempt from these reductions and as a result, police administrators are forced to make some difficult choices. To better understand the impact of reduced funding on police departments, it is important to view the makeup of a typical police budget:

Personnel and related expenses (to include overtime)	80-85%
Vehicles, fuel and maintenance	10-12%
Communications (radios, phones and networks)	3-5%

In a best-case scenario, police departments have about 5-7% for everything else -- equipment, vests, ammunition, computers, etc.

The outlook in terms of normal funding doesn't look all that promising. Pension costs are estimated to rise 4 to 5 percent in the next three years. In addition, salary increases, held to a minimum over the past few years, are expected to be in the double digits over the same three-year period (3 to 5 percent per year).

While federal laboratories and private manufacturers are continuously working to improve the working conditions and equipment of law enforcement personnel, the truth of the matter is that, although new technology may be available, most departments are unable to take advantage of it. Lack of funds, lack of personnel and/or inadequate training all influence the timeliness and degree to which new technology is introduced in a police department.

The providers of new technology or equipment need to know what drives the police administrator's decision on whether or not to purchase it for his/her department.

- 1) Priority - How important is it to the overall operation of the department?

- 2) Cost - How much will it cost to purchase? To maintain?
How many does the department need? Are there any hidden costs?
- 3) Benefits - Does use of this equipment (technology) save real money (man-hours)? Will street officers be better able to serve the community by using the equipment?
- 4) Training - How much training is required to use the equipment? Can the technology (equipment) be used by the street officer?
- 5) How will the courts view the use of the technology? What constitutional issues will arise from its use?

Most law enforcement agencies are anxiously awaiting the introduction of new technology and, once proven to be both efficient and effective, will move rapidly to implement its use within their department. Both OC/Pepper spray and the 3M fuming wand are now used by virtually every major department in the country and the benefits are measurable. Pepper spray has substantially reduced injuries to both officers and defendants during arrest altercations. The fuming wand has reduced the cost, simplified the method, and allowed officers to search for latest prints in one-tenth the time of past procedures. The point is that both scientists and manufacturers have developed these products based on not only the needs of the street officer, but on practical application and minimal costs.

Industry needs to pay attention to the priorities set by law enforcement. Therefore, research and development should concentrate on the following areas:

- ▶ Remote Weapon Detection
- ▶ Less-Than-Lethal Technology
- ▶ Reduction of High-Speed Pursuits
- ▶ Officer Protective Devices
- ▶ Evidence Collection

One solution to the lack of adequate funding to purchase new equipment or technology may be in the use of non-tax revenues or creative funding. Examples include:

- 1) Asset forfeiture monies
- 2) Donation programs
- 3) Fees added to criminal convictions
- 4) Criminal restitution programs
- 5) Foundations
- 6) Grants

While these are only suggested revenue sources, I would be remiss if I did not caution agencies that private funding can create questions of improper access to, and control over, public services. However, with proper checks and balances, any suggestion of impropriety can be overcome.

In closing, let me state something we all recognize -- government is changing dramatically. We can no longer afford, nor will we be permitted to operate government as we have in the past. Law enforcement needs to be creative and visionary in preparation for the 21st Century. "Doing more with less" is easier with the introduction of new technology. However, we all have a responsibility to ensure that whatever new technology is developed is both practical and affordable for the law enforcement community.

Mr. SCHIFF. Thank you, Colonel Baker.
Chief Cansler.

**STATEMENT OF ROBERT E. CANSLER, CHIEF OF POLICE, CITY
OF CONCORD, NC**

Mr. CANSLER. Mr. Chairman, members and staff of the committee, I'd like to thank Representative Heineman for his most eloquent fabrication on my behalf. With that, go straight to a couple of salient points.

One of the things that was prevalent among the committee was sort of a self-examination of what the role of the Federal Government should be in law enforcement, and specifically, in addressing today's crime problem. I am the chief of police of a town of 32,000. We are a quite active town. We have 76 sworn regular officers and 4 special officers. Of those 80 or so officers, we addressed 57,000 demands for service last year. These range from persons who were playing their music too loud to murder.

One of the things that has been prevalent in our city as others, is the rise in violent crime. We are up 312 percent in 10 years, from 70 cases in 1982, to 219 in 1992.

Recently, the U.S. Supreme Court addressed the role of the Federal Government in law enforcement. The recent case of *U.S. v. Lopez* struck down earlier Federal legislation on gun-free school zones, predominantly because it seemed to be missing a constitutional basis like the affecting interstate commerce provision. To me what the U.S. Supreme Court has said to Congress and to us in the business, is that if we're going to address things like those statistics and like guns at schools, you need to do it through supporting local law enforcement.

For years, the private sector has worked smarter and we have worked harder. The reason for that is we have not adopted technology as rapidly as the private sector. But there are a number of reasons for that. Some of those relate to technology that isn't completely tested. I'd like to give you a real-world example of how that can impact a local agency.

Like most police chiefs, I viewed the Rodney King videotape and said there has got to be a better way. There has got to be a better way to control somebody who is out of control. I thought I found that with pepper spray. Here was a natural product taken from the same thing that we serve in Mexican food. I couldn't find any litigation that dealt with the use or abuse of pepper spray at the time. We even adopted a manufacturer's product that was labeled on the outside of the can, "Nontoxic."

The distributor that furnished our pepper spray indicated that it would work about 80 to 90 percent of the time on out-of-control suspects. We used it 13 times from the time we adopted it until July 11, 1993. Of those, in 11 cases, we needed no further use of force. The distributor indicated that the experience would include "an immediate closing of the eyes, a coughing, gasping sensation, and an intense burning of the skin." Further, we were told "the respiratory effects would gradually diminish over a 10- to 30-minute time frame," and "subjects who had difficulty in recovery should be given medical attention if symptoms have not dis-

appeared in 1 hour." Those are direct quotes from the manual of the distributor.

In the early morning hours of July 11, 1993, my officers arrested two people at a disturbance in the parking lot of a local restaurant. One, a former high school and college football player with a blood alcohol content of 14, would not submit to the arrest. Pepper spray was used to take him into custody by officers who were smaller than he was. He was finally taken into custody when additional officers overpowered him and handcuffed him. Eighteen minutes later, not an hour, this young man was dead.

This tragedy triggered a civil disturbance in my town. A store was burned to the ground. Eighteen people were arrested for inciting to riot. We operated under a declared state of emergency for 7 days. On August 26, 1993, the Office of the North Carolina Chief Medical Examiner released autopsy findings that included, "A pre-existing bronchitis, a significant underlying pulmonary condition that conceivably predisposed him to hyperactive airways." Their report concluded that cause of death was "asphyxia due to bronchospasm precipitated by pepper spray."

Extensive investigations by the North Carolina State Bureau of Investigation and a civil rights investigation by the Federal Bureau of Investigation did not produce any probable cause for any criminal charge against the involved police officers. We are now defending a civil suit for wrongful death against the involved officers that has become the national test case on the use of pepper spray. I can't think of a better illustration of the need for independent testing of police products.

Following the July 1993 incident, the National Institute of Justice included our experience in two publications that went out to other law enforcement agencies so that they could benefit from our collective experience. With additional funding, the technology assessment program could assume a more proactive role with more upfront testing.

In my agency, our budget of \$4,041,477 does not include a single dollar for research and development. We must depend totally on review of the work of others. Those technical reports have been very helpful to us in purchasing many items of our equipment. As has been pointed out, there are 17,000 agencies coast to coast. It's a very decentralized market with no central purchasing point.

Few industry giants are going to invest the kind of money it takes to do research and development to such a decentralized market, with the type of legal landmines we have discovered.

Recently, a chase in my city resulted in speeds of over 90 miles per hour, where we pursued two bank robbers into the city of Charlotte. We successfully took the robbers into custody. We recovered the gun. We recovered the money. They are suspects now in seven other bank robberies in three States. There were no injuries to the officers or to any citizens. Two police cars are total losses, and four citizen vehicles were damaged by the fleeing robbers. Grave danger was incurred by the three officers who pursued those fellows.

We are the most technically advanced Nation on Earth. We can intercept incoming enemy missiles and destroy their guidance system. We have regular manned space flights. We have artificial intelligence. No one is going to convince me that we can't develop an

effective method of remote control vehicle disablement. But the project has never been made attractive to industry.

Indeed, two products, just two, one that would help us gain control of those out-of-control people, like the young man in the parking lot, and a method to shut off that fleeing vehicle, like the chase we had last month, would literally revolutionize the way local law enforcement does business. That, folks, is your front line defense. Thank you for your time.

[The prepared statement of Mr. Cansler follows:]

PREPARED STATEMENT OF ROBERT E. CANSLER, CHIEF OF POLICE,
CITY OF CONCORD, NC

Good morning, ladies and gentlemen of the committee. I am Robert Cansler, Chief of Police of the City of Concord, North Carolina. I am also an attorney licensed to practice before the Supreme Court of the United States. For those of you not familiar with North Carolina, Concord is a city of over 32,000 located just north of Charlotte. You can watch part of our city on cable TNN and ESPN for the next two weeks because we are the home of the Charlotte Motor Speedway and the Coca-Cola 600 stock car race.

I am here as a local law enforcement officer to address what I believe to be the single most important thing the federal government could do to assist those of us on the front line and make law enforcement more effective in the long run.

The basic concept of our Constitution was radical at the time of its conception. "That government is best that governs the least" is an often quoted comment by Thomas Jefferson on the limited role of the federal government. In my profession, this concept means that federal law enforcement agencies and courts have limited roles in the ordinary day-to-day business of maintaining law and order. Instead, the local citizens look to the "cop on the beat" for the solution to their problems. In my city of 32,000, 76 sworn regular and 4 special police officers responded to the public 57,000 times in 1994 for everything from music that was too loud to murder. Like everywhere else in the nation, our violent crime rate has

increased dramatically over the last 10 years from 70 cases in 1982 to 219 in 1992, an increase of 312%. If this Congress is going to make any difference in these typical statistics, you must do so by supporting local law enforcement. Indeed, isn't that statement the real message to you from the United States Supreme Court in US v Lopez 514 US ____ (4/26/95) which struck down earlier federal legislation regulating gun possession in school zones.

While technology has invaded the rest of our world and let the private sector work "smarter," we continue to do things as we have for the past 100 years. Indeed, until the recent development of the super glue pen by the National Institute of Justice, we took fingerprints in exactly the same way as at the time of the creation of Sherlock Holmes. Let me give you a real world illustration of why technology is accepted slowly by law enforcement:

Like most police chiefs, I reacted to the Rodney King videotape by searching for a better way to control a person who was out of control. I thought I found it with pepper spray. Here was a natural product containing the same active ingredients as Mexican food. Even the container of the brand we bought was labeled "non-toxic." Our research at the time did not reveal a single piece of litigation over the use or misuse of pepper spray. Other agencies' experience indicated that the use of pepper spray would subdue a resisting suspect

80 - 90% of the time. The manual of operations given to our personnel by our pepper spray distributor in November 1992 indicated that pepper spray use resulted in:

- (1) "immediate closing of the eyes."
- (2) "a coughing, gasping sensation."
- (3) "an intense burning of the skin."

Further, we were told "the respiratory effects will gradually diminish over a 10 to 30 minute time frame," and "subjects that seem to have difficulty in recovery should be given medical attention if symptoms have not disappeared in one hour." Between January 1993 and July 11, 1993, we used pepper spray 13 times. In 11 of those cases, no additional force was needed.

In the early morning hours of July 11, 1993, two persons were arrested by Concord police officers during a disturbance in the parking lot of a local restaurant. One, a former high school and college football player with a blood alcohol content of .14, would not submit to the arrest. Pepper spray was used in an attempt to subdue him by officers who were smaller than he was. He was finally taken into custody when additional officers overpowered and handcuffed him. Eighteen minutes later, this young man was dead. This tragedy triggered a civil disturbance. A store was burned to the ground. Eighteen people were arrested for inciting to riot. A declared state of emergency lasted for seven days. On August 26, 1993, the Office of the North Carolina Chief

Medical Examiner released autopsy findings including "a pre-existing...bronchitis...a significant underlying pulmonary condition that conceivably predisposed him to hyperactive airways." Their report concluded that cause of death was "asphyxia due to bronchospasm precipitated by pepper spray."

Extensive investigations by the NC State Bureau of Investigation and the Federal Bureau of Investigation did not produce any probable cause for any criminal charge against the involved police officers. We are now defending a civil suit for wrongful death against the involved officers that has become the national test case on use of pepper spray. No better illustration of the need for independent testing of police products could be found.

Following the July 1993 incident, the National Institute of Justice included our experience in an extensive survey of pepper spray use that resulted in two publications so that other local law enforcement agencies could benefit from our collective experience. With additional funding, the technology assessment program could assume a more proactive role.

In my agency, our 1994-95 budget of \$4,041,477 dollars did not include a single dollar for research and development. Our technical research is totally based on a review of the work of others. Technical reports from the National Institute of

Justice have played a vital role in our purchase of police cruisers (through NC state contract), shotguns, handcuffs, semi-automatic handguns, and bullet resistant vests. These reports are thorough, complete, and most important, free of any product or manufacturer bias. The United States contains an estimated 17,000 different law enforcement agencies spread from coast to coast. Very few of these agencies have any greater technical capability than my own agency, the Concord Police Department. The technical reports and briefs of the National Institute of Justice are a perfect example of the existence of the "affecting interstate commerce" component, the United States Supreme Court found lacking in US v Lopez 514 US ____ (4/26/95), the gun free/school zone case. Through the Technology Assessment Program Advisory Council, the National Institute of Justice does a great job of getting input from the front line and transmitting it to the lab to get our concerns addressed.

I now turn to what I believe is the single most important thing this Congress and the federal government can do to assist us on the front line: **PROVIDE THE FUNDING THROUGH THE NATIONAL INSTITUTE OF JUSTICE TO DEVELOP NEW LAW ENFORCEMENT TECHNOLOGY.** No state or local government can provide the incentives needed for industry giants to do the necessary research and development to market effective products to such a decentralized market which is filled with such legal land mines.

Last month, my officers pursued two bank robbers into the City of Charlotte at speeds over 90 miles per hour. Both bank robbers, the money, and the gun were recovered. These two bank robbers are suspected in at least seven other robberies. While no one was physically injured, two police cars are probably total losses and four citizen vehicles were damaged by the robbers. Three good police officers were in grave danger of losing their lives.

As the most technically advanced nation in the world, we can intercept most incoming missiles and render them harmless. We have regular manned space flights. We have developed "artificial intelligence." No one can convince me that we can't develop a method of shutting off a fleeing motor vehicle by remote control. I also know that such a project has never been made attractive for industry. Indeed only two products:

- (1) a safe effective method of taking into custody a resisting person without injury to himself or the involved officers; and
- (2) a remote method of shutting off that fleeing vehicle;

would practically revolutionize the way local law enforcement does business.

Thank you for giving me the opportunity to present these views to you today. I will be glad to take any questions you may have.

Mr. SCHIFF. Thank you, Chief Cansler. I assume the panel and other people in the room heard the bells and whistles go off. That means we have a vote on the House floor. I am going to recess the subcommittee for about 15 minutes, and ask the Members to return as soon as possible so that we can commence the questioning of this panel.

In the meantime, our very patient demonstrators over here have indicated that they are prepared to proceed with the demonstrations while we are in recess on this vote. So I invite people in the room to observe the demonstrations.

With that, the subcommittee is in recess for 15 minutes.

[Recess.]

Mr. SCHIFF. Well, I hate to interrupt the very interesting demonstrations, but I think we need to reconvene the subcommittee hearing at this time. I'd ask the witnesses to please resume their places.

Since the subject here is technology for use of law enforcement officers, I'd like to recognize for the first 5 minutes of questioning, Congressman Chief Heineman.

Mr. HEINEMAN. Thank you, Mr. Chairman. Mr. Wenaas, I sensed some frustration with you during your presentation relative to I don't know whether you call it marketing what you have, or lack of interest by law enforcement on what you may have as far as technology is concerned, or what the industry has. There shouldn't be that with conferences and conventions, even State conferences where there is invariably a room set aside in police conferences for technology people to come and show their wares, mostly people selling uniforms and badges and weapons. Certainly, with law enforcement, as I remember it, with the capability now of asset forfeiture and the ability to spend money on technology, however they choose to spend it.

What is out there that law enforcement is not availing themselves of, for one reason or another, whether it's lack of knowledge of what is out there or perhaps lack of money?

Mr. WENAAS. Well, I had listed six or seven technologies. I think that, well, for example, stopping fleeing vehicles, weapon detection. The technology is there. It just simply has not gotten to the product form. That means the technology to do it is available. It has not been productized. I believe that there is a change afoot now to do all of that. Much of what you heard today is moving forward in that direction. We applaud that. Last year, I couldn't have even said that. So I am encouraged that there is a movement to pursue some of these technologies and to try and subsidize the development costs and to acquire some of these technologies.

Mr. HEINEMAN. You mean subsidize from the Federal Government?

Mr. WENAAS. Well subsidize the development costs in the sense that from the viewpoint of a product manufacturer, you have to recover your costs. The price of the product has to basically exceed the cost, all of the costs. Those costs include the development costs, the manufacturing costs, and the marketing cost.

When you have a situation where the cost to develop a product exceeds the amount that you can project that you could bring in sales, then there's no impetus to develop it in the private sector.

If the law enforcement community deems that these kinds of products are useful, as I do, then someone; namely, the law enforcement or the government, is going to have to pay for the development of them. This obviously is what has happened in the military and why a lot of military technologies have been developed and were highly successful.

Mr. HEINEMAN. Have you received funding from NIJ or any other governmental agency to develop, to test, to do research?

Mr. WENAAS. Not on law enforcement products. Of course our main line business has been to do that sort of thing for the Department of Defense. So we do have a lot of technologies.

Now we have on our own money developed proof of principle demonstrations for stopping cars and for what we call the liquid squirt gun, which is a liquid taser, which can incapacitate people from 20 to 30 feet with a single stream of water.

Mr. HEINEMAN. Thank you.

Mr. SCHIFF. Thank you very much, Chief Heineman. Ms. Lofgren.

Ms. LOFGREN. My question really is similar to the one I asked the first panel, which is the ability to move these products into local markets, that's where most law enforcement occurs, given the condition of local budgets, and what recommendations you have. Do you have any idea, say for example, the CONFIRM system, which I know it works very well from my local government experience, that was expensive, but you save a lot of money on personnel. If you can tie it in to the MORC system, you save a lot of personnel. You become more efficient.

Do you have any idea what it would cost, given that price would clearly come down if it was scaled into the market to put this out throughout the country and how much it might save? Has your company done any of that kind of analysis to know what we would be looking at?

Mr. WRIGHT. Absolutely, Ms. Lofgren. We considered affordability of this product very strongly when we designed it. That is, we wanted to develop it so that it was scalable, such that if necessary we could sell one to Chief Cansler's district, as well as sell one to the city of Atlanta, if you will, which would be scaled up significantly. We have succeeded in doing that.

The difficulties lie in the fact that local governments still don't have the ability to lay out the capital necessary to purchase them. So we find ourselves looking for other alternatives, in the sense of maybe finding consortiums of a number of agencies that can come together and they'd be able to afford it, or the ability to even charge them on a usage basis. We are looking at options for that kind of thing. So it never ends.

We have gotten the product to the point where it is affordable for smaller districts, all the way up to very large systems, like we are delivering to the British home office in London. But the ability still to be able to do that in a procurement sense is very hard for local agencies.

Ms. LOFGREN. Now I am interested, you moved this system or something like it into Great Britain. Did you not?

Mr. WRIGHT. I beg your pardon?

Ms. LOFGREN. You moved something like this system into Great Britain. Didn't you?

Mr. WRIGHT. That is correct. It is a scaled up version of that same system.

Ms. LOFGREN. The entire nation of Great Britain is now covered by this?

Mr. WRIGHT. Oh, no, no.

Ms. LOFGREN. Tell me more about that.

Mr. WRIGHT. The contract was awarded to us in January to start that system. We will develop a basic system at the British home office in London that will be linked throughout the entire country, to their 43 bureaus. They will have different versions of this system at each of their facilities. The Metropolitan London Police will have a much larger system than one of the smaller districts.

But this system ranges from as low as \$40,000 to \$50,000 to \$153 million system that I'm building for the British home office.

Ms. LOFGREN. So the British are going to be ahead of us really, technologically with our silicon valley stuff, essentially.

Mr. WRIGHT. That could very well happen.

Ms. LOFGREN. I guess the other question I have, and you probably can't answer it, but we may be able to get information from you when we reconvene our full committee on the terrorism bill, is the utility of the MORC system or something like it with a broader data base in the area of terrorism and apprehension of suspects. What do you think the potential of that is, the utility?

Mr. WRIGHT. I will gladly seek out data for you and get that back to you. I would like the opportunity to do that. But I obviously couldn't answer that today. We have been asked to take a look at that kind of thing in the context of what has been happening recently. We'll gladly do that.

[The information follows:]

TRW LAW ENFORCEMENT INVESTIGATIVE ANALYSIS SYSTEM

TRW has developed, using internal research and development funds, a new weapon for law enforcement agencies that could be used to help identify and locate possible terrorist suspects—the TRW Law Enforcement Investigative Analysis System.

TRW's easy-to-use data base system enables law enforcement officials to match the details of one crime to other crimes that are recorded in the data base system. Based on the principle that many criminals or terrorists follow the same method of operation (MO) in their crimes, the system uses specific crime details to automatically perform an exhaustive search against all possible suspects who are in the data base. Data bases can be developed for a variety of offenses including all types of criminal activity including both international and domestic terrorism.

The Law Enforcement Investigative Analysis System enables law enforcement officials to quickly retrieve detailed case reports, complete with photographs or artist's sketches. An extension of the investigative process, the software also saves time—thus increasing the possibility of success of apprehending suspects. A customized, relational data base with graphical query windows, the system is managed by search algorithms. It contains 250 fields or groups of information in which to search and sort. Files are secure and only can be accessed or changed by authorized personnel. The system can operate as a stand-alone or as part of a network, and law enforcement officers can access the system and submit reports while in the field using laptop computers.

Ms. LOFGREN. All right. Thank you very much. I won't unduly prolong this. I think I'm hearing the need for maybe a loan program. Maybe I'll advance a proposal later after this hearing.

Mr. SCHIFF. Thank you, Ms. Lofgren. Mr. Scott.

Mr. SCOTT. Thank you, Mr. Chairman. I'll just ask a couple of questions on how close we are to the weapon detection and the drug detection technology where you can find out whether someone has drugs or a weapon, and how close we are to making that commercially feasible.

Mr. WENAAS. I'll take weapon detection. There are two or three competing technologies for weapon detection, RF, magnetometers, IR, and acoustic systems. Each one of these systems is being developed and I think three of them are being supported by NIJ, hoping to get prototypes in 18 months. In my opinion, the technology is here to do it. It is a matter of putting together a commercial unit that could be taken out in the field and used by an officer.

Mr. SCOTT. How expensive would those things be?

Mr. WENAAS. I really couldn't say. From the viewpoint of the technology we're looking at, I was looking at per unit costs of \$3,000 to \$4,000, not including the development cost. Each technology would have its own cost tradeoffs.

Mr. MIYOSHI. I can comment on drugs, drug detection. Let's see. A lot of the technologies used for explosives detection can also be applied to drugs, either from a detection of drugs from a bulk perspective or from vapors, chemical vapors.

I am not sure what specific application you have in mind. If you are talking about screening people, if you could run people through a portal like we do at the airport, except looking for explosives and drugs, that is certainly possible. If you can gather samples, you can do that also. But I'm not sure what particular application you are thinking about.

Mr. SCOTT. Whatever. I think bomb detection might have been helpful, for example, in Oklahoma.

Mr. MIYOSHI. Oh yes. That is correct. As I mentioned in my testimony, these technologies do exist for explosives. The difficulty right now is configuring the detection systems, the collection of vapors, for example, in a vehicle type application. I feel very confident that we could develop a vehicle portal, say for example, like the entrance to a parking garage, where a vehicle has to come to a stop before they enter the garage. There's enough time then to collect the vapor sample and analyze it to see if there's any explosive vapors.

On an open street, that's a much more difficult problem because you have got dilution, tremendous dilution factors because of winds. But in a confined situation, you can certainly, I believe, detect explosives in a vehicle.

Mr. CANSLER. Representative Scott, we're field testing a trace detection method of narcotics, where we use a little, it looks almost like a fingerprint lifter. We wipe the person's hands if we have probable cause. That is inserted in a miniature computer scanner. This is a product that was developed by Westinghouse. It has been very successful with us so far. We are moving it up through the court system in a couple of contested cases to see what acceptance it has at that level. That is less sophisticated than sniffing air, of course, but still very practical. In fact, we've got some right here we'll show you. I didn't know we had it here.

Mr. SCOTT. And how does it work?

Mr. CANSLER. Well, the nutshell of it is this particular one works with cocaine. Obviously I don't use this in the field. Some of my people do. But you take the person's money, a cloth bag, hands, anything that might have come in contact with cocaine. You can wipe it with this card, then insert the card here. The machine will give you a reading positive or negative. We then use that as probable cause to do a further search, not just to the outside of the person, but of a more complete search, if you will. It has been very successful so far.

One of the other things that we do is we have sent this card in to our State crime lab after it reads positive and got the State crime lab to also verify the presence of cocaine. So far, the two are completely consistent.

Mr. SCOTT. Is that amount of cocaine enough for a conviction?

Mr. CANSLER. Well, in my State, possession of any amount of cocaine is a felony. So no matter what amount, that is sufficient for a conviction.

Mr. SCHIFF. Would the gentleman yield for one second on that? Where do you get the sample, please, to run in that machine?

Mr. CANSLER. Well, if we come up on someone who is involved in a street transaction, for example, and he may run and we apprehend him, but he's already thrown away the main part of the narcotics he had on him, then we might take this and wipe his hand and see if we get any reading that he has been involved in handling cocaine recently. Even a trace amount in my State is enough to make a case.

Mr. SCHIFF. If the gentleman will yield for one more second, I'll give the gentleman some additional time. I am told that a lot of our money supply has been contaminated with cocaine. So could any of us be having dollar bills in our pockets—

Mr. CANSLER. Let me dispel that. So far, we have not found that.

Mr. SCHIFF. All right. Fair enough. I yield back. Thank the gentleman.

Mr. SCOTT. Thank you, Mr. Chairman. I yield the remainder of my time, plus any additional time, that may be given to the gentlelady from Texas.

Mr. SCHIFF. Thank you, Mr. Scott. Ms. Jackson Lee.

Ms. JACKSON LEE. Thank you very much, Mr. Scott. You are very kind. I am going to be very brief. Mr. Chairman, I thank you for this time. I have a prior engagement that I need to leave for. I wanted to thank the gentlemen for their presentation and simply indicate that I will submit some additional questions in writing.

I am just wondering whether Mr. Grady Wright can give me just a sentence answer as to the accessibility of this technology to local law enforcement that you would find in small cities and towns along side of some of the major cities. Is this accessible as it relates to cost?

Mr. WRIGHT. It is accessible with regard to cost, I believe. The real key is their abilities in their procurement system to purchase it, or in their budgeting systems to do it.

Ms. JACKSON LEE. And is your company, TRW working to ensure that the technology is reasonable as it relates to costs? I mean, if it doesn't get out to where it needs to go because of local budgets,

downsizing, then we don't get to use it. I know you are a business, I do understand that.

Mr. WRIGHT. Well, as I indicated, affordability to the local levels at the very smallest level, was a very important factor in our designing this product. We have ranged it, by the way, from the amount of population in a particular area. We are also spearheading a lot of consortiums in some areas, where numbers of districts can come together for affordability and network their products together when they can't afford it on a very single level.

But we believe we have a product that can be afforded at the very lowest level.

Ms. JACKSON LEE. Thank you, and thank you, Mr. Chairman.

Mr. SCHIFF. Thank you, Ms. Jackson Lee. I'd like to just use my time to summarize here for a moment. I think it was Dr. Wenaas, I hope I am giving correct attribution here, who said that our military today maintains its edge in terms of comparison with other militaries around the world, through technology, through the multiplier effect of technology.

I just wanted to say that is my belief, not only as a Member of Congress, but as a Reserve Air Force officer for more than 25 years. We are publicly downsizing our military. Yet I don't see any other country looking forward to tangle with our military one on one, despite that downsizing. That is because we have maintained its capabilities through technological contribution.

I want to state that as a purely personal view, not meant to be argumentative with any individual who thinks otherwise. Following the gulf war, a number of media comments kind of pooh-poohed our accomplishment on the grounds of oh well, it was just the Iraqis. The hundreds and thousands of Iranian casualties incurred in their war with Iraq, I think are testimony to the significant military capability of Iraq, even though in terms of consumer products we would call it a Third World country. Its military was not Third World, by any stretch of the imagination. Yet we had relatively speaking, extremely low casualties. I think that it was technology which gave our military the edge in that war.

The point I am getting at is I think we are on the verge, on the cutting edge, if you will, of providing that technology to law enforcement in every way from tracking people who are on probation and parole to determine if they are every moment where they are supposed to be, to identification of individuals and suspects, to better technologies for apprehension of individuals, particularly on a nonlethal basis, to being able to render automobiles inoperative, so we don't have the constant problem of high-speed chases. In the area of smart weapons, so that if an officer loses a firearm, it can't immediately be used against that officer.

And in a number of different ways demonstrated here and referred to, I think we have the ability to give that multiplier effect to our law enforcement officers. So it's not just a matter of if you will, number of divisions in the field, although that's an important factor. But it is what is the capability of those law enforcement officers when they are in the field. I think it's pretty evident on both sides of the political aisle here, that we all feel the same way. We may have different priorities as to which technology should move forward first, but I personally discerned a unanimous view here,

that we are doing the right thing here. I just want to thank the panel and to assure the panel that anything we can do to work together to continue this move toward the multiplier effect for law enforcement we'd be glad to join with you.

With that, I thank both panels and declare the subcommittee adjourned.

[Whereupon, at 12:49 p.m., the subcommittee adjourned.]



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